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Annals of Medical History
Fall, 1926

ALEXANDER MONRO (*Primus*)
[1697-1767]

[From Neander: Tabacologia. Lugduni Batavorum, 1626.]

ANNALS OF MEDICAL HISTORY
Volume VIII Autumn, 1926 Number 3

JOHN REDMAN*

By WILLIAM SHAINLINE MIDDLETON, M.D.

MADISON, WISCONSIN

COLONIAL life in Philadelphia was established on a lofty intellectual plane, which found expression in several organizations having as their primary purpose the improvement of the members or of humanity at large. To Benjamin Franklin the Junto owed its inception and from this exclusive group of the leathern apron whose favor became widely sought, arose the Philadelphia Library Company (1731) and The American Society for Promoting and Propagating Useful Knowledge (1766). Both of these organizations have continued to function to the present day. In the case of the latter, an amalgamation with a younger group to form the American Philosophical Society was effected in 1769 with Dr. Franklin as president and with two of its three vice-presidents physicians: Thomas Cadwalader and Thomas Bond. An appreciation of the part that physicians and medicine were to play in its transactions was foretold by this election. It was furthermore to be anticipated that as the several independent, but component, interests in the vast field of science should grow, daughter organizations would come into being for the development of their specialized fields of knowledge.

Thus it was that from the parent Philosophical Society, a College of Physicians arose in Philadelphia in 1787. Twenty-two years previously the Philadelphia Medical Society had taken its place as the pioneer medical society in the Colonies. In November, 1768, this group joined forces with the American Society for Promoting Useful Knowledge and in passing out of existence left no trace of its proceedings. The New Jersey and Massachusetts societies, inclu-

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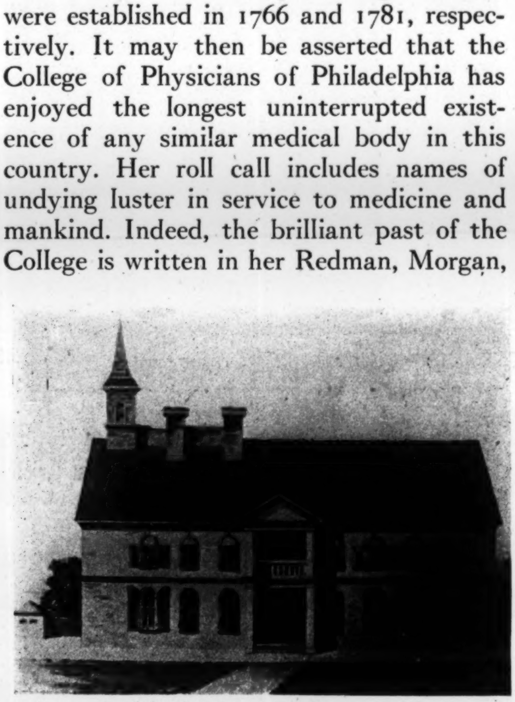
* Read before the Medical History Seminar, University of Wisconsin, January, 1926.

Note. Sincere appreciation is herewith expressed to Mr. Charles Perry Fisher of the Library of the College of Physicians and to Mr. Bunford Samuel of the Ridgway Library for the photographs and photostatic reproductions included in this sketch.

sive in their membership and organization, were established in 1766 and 1781, respectively. It may then be asserted that the College of Physicians of Philadelphia has enjoyed the longest uninterrupted existence of any similar medical body in this country. Her roll call includes names of undying luster in service to medicine and mankind. Indeed, the brilliant past of the College is written in her Redman, Morgan, Rush, Jones, Shippen, Kuhn, Wistar, Barton, Chapman, Wood, Pancoast, Gerhard, McClellan, Norris, Stillé, Leidy, Mitchell, Gross, Agnew, Pepper and a host of other names high in medical attainment.



The Old Academy.

Naturally, the College of Physicians did not come into being spontaneously or through the efforts of a single interested individual. Doubtless, its organization had been for many years the subject of discussion among physicians of the city. The crystallization of the plan in all probability depended on the dynamic Benjamin Rush. At least from the Rush manuscripts there may be gleaned in several sources references to his expression of such a plan. On June 25, 1783, Dr. Francis Rigby Brodbelt of Spanish Town, Jamaica, in a letter to Rush implied the existence of such an institution: "I wish much to belong to your Philosophical Society at Philadelphia, and to be an honorary or ordinary fellow of your College of Physicians." A fellow Philadelphian, Samuel Powel Griffitts, thus addressed Rush from London in August of the same year: "Your idea of an American College of Physicians is what has several times occurred to me." Furthermore John C. Lettsom, an English patron of medicine in this country, encouraged Rush in his plan.

The interested parties probably met to organize in the old Academy at Fourth and Arch Streets in September, 1786, but it was not until January 2, 1787, that the proceedings of the College began. This date is established by the minutes. In its constitution published in *The Pennsylvania Packet and Daily Advertiser*, February 1, 1787, a high ideal was set for its existence:

> The objects of this College, are, to advance the Science of Medicine, and thereby to lessen human misery by investigating the diseases and remedies which are peculiar to our country, by observing the effects of different seasons, climates, and situations upon the Human Body, by recording the changes that are produced by diseases by the progress of Agriculture, Arts, Population and manners, by searching for medicines in our woods, Waters and the bowels of the Earth, by enlarging our avenues to knowledge; from the discoveries and publications of foreign countries, by appointing stated times for Literary intercourse and communications, and by cultivating order and uniformity in the practice of Physick.

S. Weir Mitchell has described the first gathering in his inimitable style:

> By the dim light of candles, for which I have found the modest bill, clad after the fashion of the day, some in Quaker dress and some in knee breeches, silk stockings, and low shoes with buckles, most of them carrying, I fancy, the gold-headed cane and the meditative snuff-box, some with queues or powdered wigs, a fading fashion, were John Jones, William Shippen, Jr., Adam Kuhn, Benjamin Rush, Thomas Parke, Gerardus Clarkson, Samuel Duffield, James Hutchinson, William W. Smith, Andrew Ross, William Clarkson, James Hall, William Currie.

John Redman, John Morgan, George Glentworth, Abraham Chovet, Benjamin Say, Samuel Powel Griffitts, Benjamin Duffield, John Morris, John Carson, John Foulke and

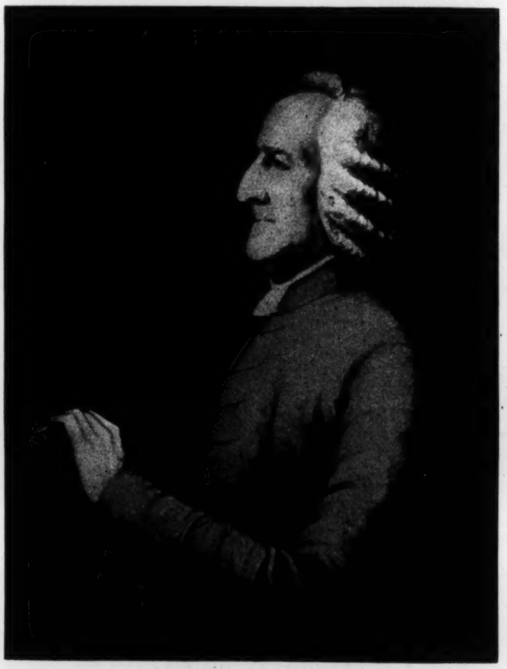
Robert Harris had been added to the roll of Fellows and Junior Fellows by the birthday of the College, January 2, 1787.

The first election of officers of the College was held in October, 1786, however, and to the presidency was elected John Redman, ripe in years and high in the esteem of his fellow-practitioners and fellow-citizens. His Inaugural Address was postponed until December, 1786, by reason of his inability to attend the preceding meeting. In accepting the high honor bestowed upon him, Redman expressed his profound gratitude and his sense of inadequacy. His habitual self-abnegation is typified by his words:

> [I] look within myself and consider my powers . . . and also that line of life which I have walked in from choice, having in my constitutional frame no great desires of exaltation above the middle state, or high ambition than to conduct therein rather with integrity and usefullness than éclat. After such a view I say it would be vanity or Arrogance in me, not to suppose that my Election was more owing to the generous benevolence of your own minds, as a mark of respect to my age and longer Standing in the profession, and as a kind of disinterested testimony of your Approbation of my general Conduct in life and regularity in the practice of our art, Than to any peculiar merit of mine.

True, John Redman was the Nestor of the Fellows of the College, being sixty-five years of age, whereas the next oldest Fellow was John Jones, fifty-eight years old. Redman, in this address, voiced his regret that by death the honor conferred on him had been denied two worthy contemporaries, Thomas Cadwalader and Thomas Bond. He bespoke the assistance of those "whom I have the honor to call my professional children." The inaugural was concluded by invoking divine aid and guidance in the affairs of the College.

The physician who had arisen to this position of honor and trust in the first presidency of this new organization was a Philadelphian by birth, having first seen the light of day in the city of his later professional achievement, on February 27, 1722. John Redman received his early education in the Reverend Mr. Tennent's Academy at Neshaminey, Bucks County, Pennsylvania. Greek and Latin were the favored studies in this boarding school and young Redman gained considerable facility in the classical languages. The subsequent clerical careers of his schoolmates, Gilbert Tennent, Daniel Lawrence and Rogers, undoubtedly influenced his religious devotions later in life, since these men corresponded with him regularly.



JOHN REDMAN [1722–1808].

Redman's medical education began in the difficult apprenticeship under Dr. John Kearsley, Sr., of Philadelphia, of whom John Bard wrote that he had "a morose and churlish temper, which banished all cheerfulness and social converse from his pupils and rendered him an unpleasant companion." S. Weir Mitchell has enumerated among the functions of Kearsley's apprentices: "servant, coachman, messenger-boy, prescription clerk, nurse and assistant surgeon." The Bond brothers, Lloyd Zachary, Thomas Cadwalader, William Shippen, Sr., Cadwalader Evans, John Kearsley, Jr., and John Bard complete the roll of familiar names of distinguished physicians who survived the rigorous preceptorship of John Kearsley, Sr.

In that day of sailing vessels the tide of commerce followed the trade winds and commercial intercourse between the Atlantic seaboard and the West Indies formed a larger share of the life of the English colonies than in the later days of steamships. The natural outcome of this relationship was the more common transplantation of young medical men from North America to that field. John Redman practiced medicine in Bermuda for several years. The opportune financial support of his father, supplemented by a loan from Judge Allen, enabled him to seek his finishing touches in Europe.

JOHN REDMAN.

Edinburgh was in its heyday and it was but natural that Redman should find his way to the feet of Monro primus. Indeed, thither were to go practically all of the men who molded early medical education in America. So far as can be ascertained, a year was spent in Edinburgh under Monro, Sinclair, Alston, Plummer and Rutherford. Painstaking notes of the young medical student in Edinburgh, copied in turn by B. Duffield, one of his later students in Philadelphia, are preserved in the College of Physicians. Those from Monro constitute in effect a brief history of anatomy, whereas the Alston lectures on materia medica are much more comprehensive. The title page to the latter is interesting: "A Course of Publick Lectures on Materia Medica by Charles Alston, Professor of the Mat. Med. and Bottany In the Colledge of Edinburgh Taken from his mouth during the time of Lecturing By John Redman Student of Physick and Surgery in the same Colledge in proprium usum—Anno Domini —1746." Some confusion exists in the records of the sequence of events succeeding the Edinburgh sojourn. It is at least certain that Redman studied under Albinus, Gaubius and Musschenbrock in Leyden. Here he was graduated July 15, 1748, defending his thesis, "De Abortu." Redman concluded his essay thus: "Faxit Deus Ter Opt. Max. ut Haecce mea studia et conamina dirigantur in nominis sui gloriam, proximorumque salutem." (God grant that my studies and labors may be directed to the glory of his name, and to the welfare of my neighbors.)

Completing his medical course in Leyden, Redman sought to further his training in the medical centers of Paris and London. Of the Paris period no record is extant. In London he attended lectures and further pursued his anatomical studies by dissection. His activities apparently centered in Guy's Hospital, from whose staff the following testimonial was obtained:

> We think the character of Dr. John Redman so much deserves our approbation, that it is with pleasure we can say, that after having spent a considerable time in the universities of Edinburgh and Leyden, in which last he had the degree of doctor of physic conferred on him, and made all the improvements necessary to the knowledge of physic, he has with great application attended the practice of this hospital, by which means he has so well qualified himself that we doubt not his future success will

answer to the care and pains he has taken to deserve it.

Signed
—CLARKE, M.D.
CHAS. FEAKE, M.D.
N. MUNCKLEY, M.D.

Guy's Hospital
Feb. 21, 1748–9.

With a medical training far surpassing his most favored townsmen, Redman returned to Philadelphia. His professional success was early assured. Indeed, so great was the demand on his time and strength that he found it necessary to limit his activity to medicine. It has been stated that he eschewed surgery and obstetrics from a desire to specialize in medicine, but unquestionably the limitations set by his delicate constitution decided this issue. In keeping with the therapeutic principles of the time, Redman believed that more strenuous treatment and dosage were indicated for the American than for his English cousin. This curious fancy held sway for several generations longer, as the vitriolic Charles Caldwell bore witness. The principles of Boerhaave tempered by the British influence of Sydenham marked his early practice. It was characteristic of his adaptability that he should late in life absorb the teachings of Cullen and indeed adopt the essentials of the dissolute Brown. Throughout his life he stood ready to revamp his theory and practice of medicine with the changing tide of time. A phlebotomist of the old school, he measured lances with the most able of its opponents in Philadelphia, a position which found him at the side of Benjamin Rush in spirit if not in person in the trying days of 1793. Always punctual in his appointments, Redman held his clientele through faithful attention to their needs. Of his bedside manner a charming description is preserved:

> In a sick room he possessed virtues and talents of a specific kind. He suspended pain by his soothing manner, or chased it away by his conversation, which was occasionally facetious and full of anecdotes, or serious and instructing according to the nature of his patients' diseases, or the state of their minds. A lady, whom he attended in a fatal consumption, said to one of his friends, that "death had nothing terrible in it when Dr. Redman spoke to her about it."

Weir Mitchell was the spokesman for the medical profession when he stated that "one would like to possess the secret of this anaesthetic kindness."

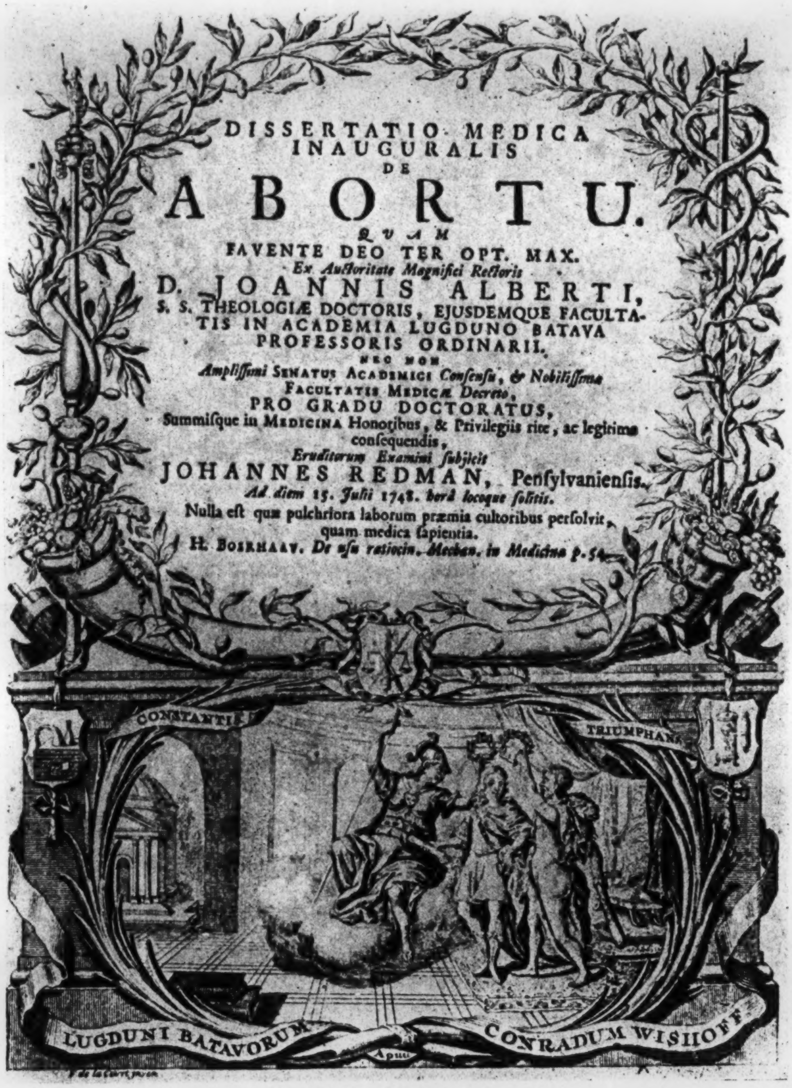
A letter to one of his patients, a Mrs. Ferguson, dated May 3, 1773, is to be found in the Library of the Historical Society of Pennsylvania:

> Dear Madam:
>
> I should have answered your favor before, but still waited to do it by my wife who tho very desirous of going, has been hindered by weather or some other particular circumstance till now. I am sorry that you feel discouraged at my saying I thought the case not wholly nervous, by which I only meant that there was probably some local debility, or impediments to the urine, besides what might arise from the general disorders of the nerves, and perhaps will be full as likely (if not more so) to be remedied, than if it was wholly in the nerves; however we shall be able to judge better after taking these medicines which I hope you continue steadily to use; Thus far I wrote when yours by Mr. Ferguson informs me that you are rather better, but not yet begun the pills, so that we must still wait for their conjunct Effects. I am sorry you are more costive under them, They generally have the contrary Effect. Let me know by the return of my wife, more particularly respecting the urine since you have used.
>
> With due respects, I am Dr. Mad'm
> Your affectionate friend & Hble Sevt
> John Redman

Certainly no clinician would gainsay Dr. Redman's wisdom and prudence in medical advice on this account.

Watson has preserved an amusing episode of Redman's rebuttal of a seeker for gratuitous medical advice: Following his accustomed habit the doctor had entered a public house to do some writing. Whereupon the ubiquitous leech accosted him. Redman feigned deafness and the questioner repeated:

"Doctor! what would you advise as the best thing for a pain in the chest?" Dr. Redman meditated for a moment after replacing his tilted wig and replied, "Oh! ay—I will tell you, my good friend, the very best thing I could advise you to do for a pain in the breast is to consult your physician!"

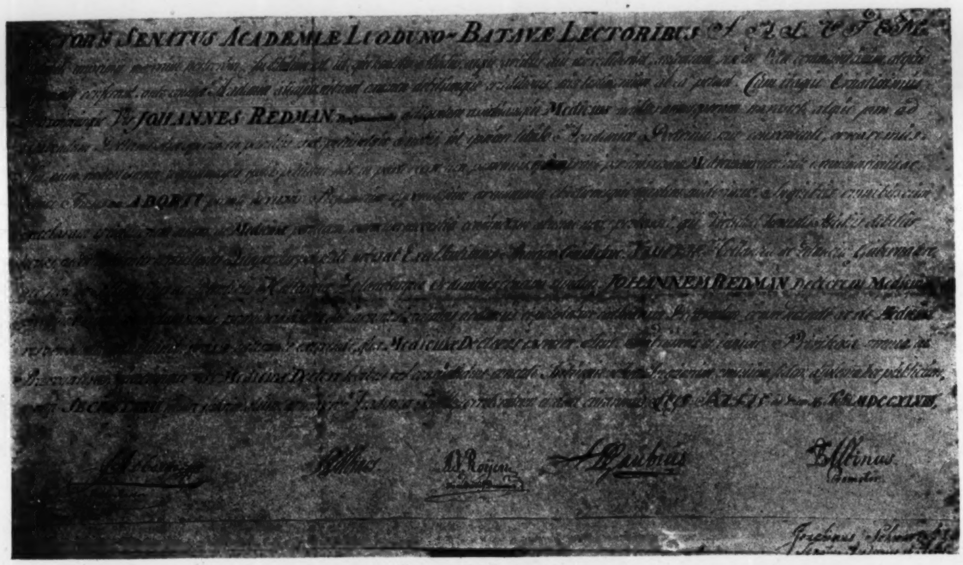


DISSERTATIO MEDICA
INAUGURALIS
DE
ABORTU.
QUAM
FAVENTE DEO TER OPT. MAX.
Ex Auctoritate Magnifici Rectoris
D. JOANNIS ALBERTI,
S. S. THEOLOGIÆ DOCTORIS, EJUSDEMQUE FACULTATIS IN ACADEMIA LUGDUNO BATAVA
PROFESSORIS ORDINARII,
NEC NON
Ampliſſimi SENATUS ACADEMICI *Conſenſu*, *& Nobiliſſimæ*
FACULTATIS MEDICÆ *Decreto*,
PRO GRADU DOCTORATUS,
Summiſque in MEDICINA Honoribus, & Privilegiis rite, ac legitime
conſequendis,
Eruditorum Examini ſubjicit
JOHANNES REDMAN, Penſylvanienſis.
Ad diem 15. *Julii* 1748. *hora locoque ſolitis.*
Nulla eſt quæ pulchriora laborum præmia cultoribus perſolvit,
quam medica ſapientia.
H. BOERHAAV. *De uſu ratiocin. Mechan. in Medicina p.* 54.

LUGDUNI BATAVORUM
Apud
CONRADUM WISHOFF

Title Page of Redman's Thesis.

To his patients he was the soul of devotion, and it came to pass that "no physician of his day exerted a more powerful and extensive influence over the practice of medicine in this country than Dr. Redman." This reputation depended less on his medical practice, which could in that period have exerted only a very local influence, than on his services as a preceptor and his active participation in every good work in the medical and civic community of Philadelphia. Redman was not a prolific contributor to medical literature. His graduation thesis, "De Abortu," was a creditable performance, but obviously without bearing on the practice of midwifery, in which he was said to have excelled, but which he early forsook from ill health. As early as 1759 Redman published a defense of inoculation and urged the use of mercury as a "preparative" for smallpox. This pamphlet was addressed to the public and its convincing yet kindly tone won many adherents to the practice.



REDMAN'S DIPLOMA.

His account of the epidemic of yellow fever of 1762, prepared at the request of his "professional children" and read before the College in 1793, was deemed worthy of preservation for its medical and historical interest by that body as late as 1865. The chronology of this account was derived in a large measure from Redman's day book. The epidemic began August 28, 1762, reached its peak in the fourth week of September and ceased in the fourth week of October. This outbreak was virtually confined to an area bounded by Pine Street to the north, thence three or four squares south and from Water Street on the east (Delaware River) to Third or Fourth Street on the west. Redman subscribed to the belief that the first case was imported from Savannah in the person of a sailor, stricken by the disease on shipboard, whose friends secretly brought him to the house of one Leadbetter, living close by the "new" market. For this shortsighted act Leadbetter paid dearly with his own life and with those of a number of his immediate family.

Redman devoted the great share of his presentation to the treatment of yellow fever. For the prevention of the fever he advised temperance in all things. He urged that the physician pay no visit to a sick patient on an empty stomach. An inevitable quid of tobacco in the mouth possessed peculiar virtue, since it prevented the swallowing of saliva. The danger of contagion was, in his opinion, much reduced through the fumes evolved by plunging a hot iron into a bowl of vinegar. The manifold prophylactic measures then in vogue were, with the exceptions stated, disapproved by Redman as affecting the mind, "with such fears as I thought were likely to render me more susceptible of infection than the omission of them." While an active bloodletter in many other conditions, he reserved the lancet in this fever for those with a full pulse or attendant pregnancy. His active therapy was influenced by his old preceptor, Dr. John Kearsley, Sr., and partook most decisively fo the polytherapeutic demands of the time. Ater the practice of Kearsley he purged his yellow fever patients with Glauber's salt, using one dram every hour or two for upward of four doses or until the "bilious matter was turned downwards and plentifully discharged." To counteract the depressing action of such depletion, he administered "wine, vinegar, whey, thin gruel or Barley and raisin drink with a little wine in it." The saline laxative was repeated on the second day, but only two or three doses were given. Tartar vitriolate was exhibited as an anti-emetic. Carminatives in the form of mint or cinnamon water and decoctions of snake root were deemed useful.

Caricature of Redman. (From a Picture in the Ridgway Library.)

A significant passage reveals Redman's conception of the disease and his reaction toward its therapy:

> But a plain inference from our manner of encountering it is, that whatever might be the specific quality of the morbid cause, its effects were a stagnation and corruption of the bile and the contents of all the abdominal glands, dissolving the blood and other fluids, and thereby depraving and debilitating all the functions of life, and rendering them unfit and unable to preserve it, and that our chief curative intentions were to discharge the morbid matter as fast as possible, first by the prima viae, and then by the pores of the skin and the urinary passages, and at the same time using such medicines as tended to correct any acrimony in the fluids, resist their effects, and strengthen the whole habit for their expulsion, and with such kind of nutriment as was adapted to the same purpose, or to restore strength to the debilitated powers after the disease was terminated.

This exposition of the rationale of the depletion therapy of yellow fever at that period is particularly lucid.

Whatever honor may be Redman's due in the world of medicine by reason of his scant medical publications or his preeminence in practice, it is far outweighed by his contributions to medical education. The physical isolation of the Colonies and their total lack of facilities for medical instruction afforded ideal conditions for the growth of the preceptor system. Indeed, only the favored sons of the well-to-do were granted the coveted opportunity for foreign training. Probably the inherent sense of the inadequacy of their local education impelled the more fortunate of the apprentices to follow their master's footsteps to Edinburgh, London and the Continent. On the other hand it was especially fitting that those individuals who had been so favored, should open their offices to "house pupils" and apprentices on their return. To share the board and in turn to reflect the glory of John Redman, came a most notable group of young men, including John Morgan, founder of the first medical school in North America, Benjamin Rush, the most brilliant American clinician of all times, termed by Lettsom the American Sydenham, Caspar Wistar, the first American contributor to anatomical science and author of the first American treatise on this subject, and John Redman Coxe, the founder of medical journalism in Pennsylvania.

Nor were Redman's collateral efforts confined to medical preceptorship; for on February 10, 1752, he was appointed to serve as a consultant to the Pennsylvania Hospital. Serving with him were Drs. Graeme, Cadwalader and Moore. With the managers of the hospital, several fellow consultants and some thirty students, he attended Dr. Thomas Bond's introductory lecture at the latter's home on November 26, 1766, which preceded the first clinical courses at the Pennsylvania Hospital by one week. Redman's interest in this ancient institution of mercy did not wane until, by reason of ill health, he withdrew from participation in its active affairs after twenty-nine years of service. He, likewise, served as trustee of the College of Philadelphia and of the College of New Jersey. In the former capacity he acted from 1762 until the union of the College of Philadelphia with the University of the State of Pennsylvania to form the University of Pennsylvania in 1791. Whether or not his resignation was in the nature of a protest is not recorded. From 1784 Redman was active as an elder in the Presbyterian Church.

His interest in medical organizations found an early expression in his membership in the short-lived Philadelphia Medical Society, the priority of whose foundation (February, 1765) has been established. At the time of its amalgamation with the American Society for Promoting Useful Knowledge (November 11, 1768), Graeme, Cadwalader, Redman, Morgan, Kearsley, Clarkson, Bayard, Harris, Rush, Souman, Glentworth and Potts, presumably the entire membership of the medical society, were constituted a committee on physic. Until his death, Redman maintained his membership in the American Philosophical Society, which succeeded the American Society for Promoting Useful Knowledge.

As has been indicated, Redman was one of the founders and the first president of the College of Physicians of Philadelphia. In his relations to this organization he was most faithful. He was rarely absent from the stated meetings and his counsel was sought on frequent occasions. Thus we find him on the committees for forming a pharmacopoeia and for presenting the College charter to the legislature in 1788. The proposed general illumination on the occasion of Washington's passage through the city on his journey from Mt. Vernon to New York in 1789 was strenuously opposed by the College because of a prevailing epidemic of influenza. Hence a committee, including Redman in its membership, was appointed on April 16 to advise the civil authorities of the danger. In November of the same year he served on a committee from the College advising the Legislature as to measures of prevention against the introduction of contagious diseases into the state. Singularly on this committee served James Hutchinson, who was to be a martyr in the yellow fever epidemic of 1793. In his official position as president of the College, Dr. Redman advised Governor Thomas Mifflin in September, 1799, that it would not be safe to hold elections in Commissioners Hall, Southwark or in the State House on account of the fever, but that Town Hall in Northern Liberties would be an acceptable polling place. In November, 1793, the College rejected the Rush report to Governor Mifflin and adopted a substitute incorporating the theory of the foreign origin of yellow fever. On November 28, 1799, Redman, contrary to his own opinion and to that of his distinguished student, Benjamin Rush, then withdrawn from the College, affixed his signature to a majority report of the College reaffirming its belief in the foreign origin of yellow fever. The controversy which waged over this point threatened to disrupt the College and indeed had driven from its fold such representative men as Rush, Caldwell, Dewees, Coxe and Physick. It is a matter of some historical interest that with few exceptions the supporters of the theory of the foreign origin of yellow fever had been deserters from their posts of professional duty during the several epidemics.

Ill health deprived Rush of the active support of his preceptor in the appalling epidemics of yellow fever, beginning with that of 1793. Apparently his continued presence in Philadelphia, as related to Reverend Ashbell Green, during the epidemic of 1798 was contingent on the promise of medical inactivity made to his wife. Redman had retired from practice at a relatively early age because of ill health, which had for years limited his activities. At forty years of age, Redman suffered from a subphrenic abscess, which, rupturing intrathoracically, was discharged through the bronchi. Subsequent to this primary illness there were frequent periods of incapacity throughout his long life. His famous report on the yellow fever epidemic of 1762 contains references to the infirmities of age, superinduced by rheumatism and influenza, and there is evidence that he suffered two attacks of yellow fever. Withal the feeling gathers that this old master marshalled his forces well to exceed the Biblical span by some sixteen years.

John Redman, the physical man, lives to posterity through several interesting word pictures. He was somewhat below average height. His eyes were black and unusually animated. His complexion was swarthy. The mental vigor was stamped by his active speech and gesture. Dr. James Rush wrote thus of his perennial visits on a fat pony mare to his old friends, subsequent to his retirement:

> I remember him well hitching her to the turnbuckle of the mansion shutter, so that she always stood on the foot-pavement, when he visited my father which he made it a point to do once or twice a year. In the rough cutting of his likeness, which was given to me by a member of his family, the hat, wig, nose, mouth, chin, eye, dress, person, expression, and character are admirably true. The mare is not so well done. The doctor retired from practice about 1785, and was known to the public as an antiquated looking old gentleman. He was usually habited in a broadskirted dark coat, with long pocket-flaps, buttoned across his under dress, and wearing, in strict conformity to the cut of his coat, a pair of Baron Steuben's military shaped boots, coming above the knees.

Watson continues the description thus:

> His hat flapped before, and cocked up smartly behind, covering a full bottomed powdered wig—in the front of which might be seen an eagle-pointed nose, separating a pair of piercing black eyes—his lips, exhibiting (but only now and then) a quick motion, as though at the moment he was endeavoring to extract the essence of a small quid.

Another noted:

> The Doctor was hard of hearing; but brisk and lively in his movement and address to any one having business with him, and pleasant to a degree. When spoken to, he usually lifted with a finger the corner of his wig from one ear, in listening attitude. While on the street, every one seemed pleased on observing the light elastic step of the very respectable old gentleman.

In the matter of personality, posterity likewise fares well in the vivid description of Redman. Weir Mitchell summarizes him thus: "A man gentle without lacking force, religious without a trace of bigotry, and finding in his faith only larger reasons for cheerfulness. Quick of temper and as quick to regret it; punctual, charitable, exact, a type of what the practice of our profession makes of the best characters, he constantly declined political place." Redman apparently mellowed with years. At least Christian forbearance and tolerance superseded hasty judgment and angry expression in his declining years.

Of the old home in Second Street near Arch, next to Dr. Ustick's Baptist meeting-house, only one room is preserved, through the medium of a descriptive word-picture in Poulson's *American Daily Advertiser* of September 26, 1828. Fortunately it concerns the Doctor's work-shop:

> His antique study, in the middle back room, now merged in part of a China Store, then exhibited the remains of consultation and practice, in byegone times. Being kept there, one day, waiting as was thought an undue length of time for his coming downstairs, the writer could not otherwise than note the ancient Franklin open stove, placed within, and under the chimney as far as possible,—the labelled vials of various sizes paraded along the mantle piece and suspended over all, in a black and gilt edged frame, now soiled by dust and age, upon the spacious old-fashioned ornamented wood work an engraved likeness of "Horace," with mottos, almost illegible beneath;—old musty papers folded away, and old Books here and there; an old great coat also folded carefully

across the leather bottomed chair, near the fire. In the center of the room stood a small hoary looking round table, covered with faded green baize, and resting upon it, an old folio, closed;—a queer looking standish for writing, and a pen with untrimmed feather sticking therein.

Soon after establishing himself in Philadelphia John Redman was married to Mary Sobers, an accomplished woman, who bore him two sons and two daughters. The boys did not survive infancy, so that the name of Redman as derived by direct lineage was interrupted in the John Redman branch of the family. The elder daughter married Daniel Coxe, the King's counsel for New Jersey, in 1770. Maintaining his allegiance to the crown, he returned to England during the Revolution and his wife and children followed him in 1785. This detachment was especially trying to one of John Redman's sincere devotion. Nor did this daughter return until 1806, when the death of her sister, who had made her home with the parents, left the old folks isolated from kin. Mrs. Redman died, in the succeeding November, at the ripe age of eighty-four, after a married life covering almost sixty years.

John Redman did not long survive his wife. On Friday, the eighteenth of March, 1808, he walked to the home of his grandson for tea. As he attempted to light the candles it was remarked that he staggered. A stroke of apoplexy succeeded and Redman succumbed the following day.

Contemporary judgment and obituary notices are notoriously uncritical of the dead, and eulogistic effusions imply a verbal bias in favor of the deceased. With these reservations, the following notice from Poulson's *American Advertiser* of March 23, 1808, may be considered:

> Died, suddenly, on Saturday afternoon in the 87th year of his age, Dr. John Redman.
>
> This venerable physician finished his education in Europe, and graduated as Doctor of Medicine in the University of Leyden; for more than half a century he exercised his profession in this city with singular reputation, integrity and humanity, always and affectionately preferring the health and lives of his patients to every other consideration. He served as one of the Physicians to the Pennsylvania Hospital, and presided in the College of Physicians of Philadelphia, until his declining strength obliged him to resign those situations.
>
> In the early and middle stages of his life, he did homage to the Gospel of Jesus Christ; but the evening of his life, was distinguished in a peculiar manner by the humility, patience, cheerfulness, and benevolence which characterize the Christian. His whole business for many years before he died, was to do good and to diffuse pleasure and instruction by his animated and pious conversation, to an extensive circle of friends and acquaintances. His remains were interred on Tuesday following, in the Presbyterian Church Yard, in Arch Street, attended by a large concourse of respectable citizens.

Thus passed from the scene of medical life in Philadelphia a worthy master of the old school. His type, with its superior training and lofty ideals of medical practice, acted as a stop-gap in a period of American history when medical schools and training were unknown. Indeed, the first medical school in America was not founded until fifteen or sixteen years after John Redman entered the practice of medicine in Philadelphia. Singularly John Morgan, one of its founders, and Benjamin Rush, one of the most brilliant teachers in its history, were his students. Still more significant is the present tendency of medical instruction to revert to the preceptor plan in the hope of regaining in a measure the lost art of medicine. John Redman did not live in vain.

Rush has preserved for posterity a toast once proposed to the medical profession by John Redman:

> The dignity and success of the healing art; and long health, competent wealth, and exquisite happiness to the individual practitioner, who makes the health and comfort and happiness of his fellow mortals one of the chief ends and delights of his life, and acts therein from motives that render him superior to all the difficulties he may have to encounter in the pursuit thereof.

These words are John Redman's benediction to us, his remote "professional children."

THE OPERATIVE STORY OF THE HEART

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I. Introduction

THE historical development of the attitude that the heart can lend itself to surgery is of great interest. Throughout the ages the heart was considered a sacred and mystic organ, not to be touched except at the expense of life. It is within recent times, only thirty years ago, that the first suture was placed in the pulsating human heart. By this operation the heart entered the domain of surgery.

After it was shown that the heart could tolerate operation, the possibilities of applying surgery to the treatment of cardiac conditions other than wounds received consideration. Definite progress has been made in the treatment of pericardial adhesions and effusions. There is probably no field of surgery that appeals to the imagination so strongly as the possibility of ligating the uncomplicated patent ductus arteriosus or of excising a segment of the stenosed mitral valve.

II. Wounds of the Heart

The history of wounds of the heart possesses dramatic interest and will be taken up in detail. It may be divided into the following periods: (1) The period of mysticism, in which wounds of the heart were considered necessarily fatal. This period extended into the seventeenth century. (2) The period of observation and experiment. (3) The period of suture, beginning in 1882. The attitude of the early physicians is illustrated by a quotation from the "Workes of that famous Chirurgion Ambroise Parey," *circa* 1590:

> The Heart is the chiefe mansion of the Soule, the organe of the vitall faculty, the beginning of life, the fountaine of the vitall spirits, and so consequently the continuall nourisher of the vitall heate, the first living and last dying, which because it must have a naturall motion of itself, was made of a dense solide and more compact substance than any other part of the body.

The story opens with the legends of Homer, about the ninth century B.C. In the "Iliad" is recorded the observation of the movements of the heart transmitted through a spear that had transfixed the heart of Alkathoos: "The hero Idomeneus smote him in the midst of the breast with the spear. . . . And he fell with a crash, and the lance fixed in his heart, that, still beating, shook the butt-end of the spear." Again, Homer, in his narration of the death of Sarpedon, sang:

> Not so Patroclus' never-erring dart;
> Aim'd at his breast, it pierced the mortal part,
> Where the strong fibres bind the solid heart.
> Th' insulting victor with disdain bestrode
> The prostrate prince, and on his bosom trod;
> Then drew the weapon from his panting heart,
> The reeking fibres clinging to the dart;
> From the wide wound gush'd out a stream of blood,
> And the soul issued in the purple flood.

We may note here that one of the late European monarchs died as did Sarpedon of Homer's narrative. In 1898 Elizabeth, Empress of Austria, was stabbed in the chest with a file by a lunatic. As the file was withdrawn from the heart the Empress suddenly perished. Death was due to compression of the heart by the collection of blood in the pericardial cavity. Had the signs of increased intrapericardial pressure been heeded, the wound, undoubtedly, could have been sutured. The procedure could have been carried out most safely if the heart had been exposed at operation before withdrawing the file. But at this late date, recent as it may seem, the pulsating heart in the human had been exposed to view only a few times, and the veil of mystery to the surgeon was just being lifted.

Hippocrates, the revered Father of Medicine, did not emphasize any special danger of wounds of the heart as did later writers. Wounds of the heart undoubtedly occurred in the great Persian wars and in the subsequent struggles for supremacy in Greece. Aristotle, Ovid, Celsus, Pliny and Galen regarded them as absolutely and necessarily fatal.

Aristotle (384–322 B.C.) said: "The heart alone of all the viscera cannot withstand serious injury. This is to be expected because when the main source of strength [the heart] is destroyed there is no aid that can be brought to the other organs which depend upon it." Ovid (43 B.C. –17 A.D.) wrote: "Although Aesculapius himself applies the sacred herbs, by no means can he cure a wound of the heart." Celsus (first century A.D.) stated: "When the heart is wounded much blood is lost, the pulse weakens, pallor becomes extreme, a cold and foul sweat arises from the stricken body, the extremities become cold and speedy death follows." Pliny the Elder (23–79) said: "This is the only one among the viscera that is not affected by maladies, nor is it subject to the ordinary penalties of human life; but when injured, it produces instant death." Galen (130–200?) observed wounds of the heart in gladiators. He said: "If a ventricle were wounded these gladiators died very soon, and especially so if the left ventricle were wounded. If it was a non-penetrating wound they sometimes lived until the following day, and as long as they lived they were of sane mind, which is testimony that the heart is not the seat of the mind."

Fallopius (1523–1562) asserted: "Wounds of the heart are always followed by sudden death. When wounded it cannot heal, being too firm, always in motion, and of an inflammatory heat." Paré (1509–1590) wrote:

> By these signes you may know that the heart is wounded: If a great quantity of blood gush out, if a trembling possess all the members of the body; if the pulse bee little and faint, if the colour become pale, if a cold sweate and frequent sowning assayle him, and the extreame parts become cold, then death's at hand. Yet when I was at Turin I saw a certaine Gentleman, who fighting a Duell with another, received a wound under his left brest which pierced into the substance of his heart, yet for all that he strucke some blowes afterwards, and followed his flying Enemie some two hundred paces untill hee fell downe dead upon the ground; having opened his body, I found a wound in the substance of the heart, so large as would containe ones finger; there was only much blood poured forth upon the midriffe.

Zacchias (1584–1659) recorded a case of needle wound of the heart in which death did not occur until the sixth day after the injury: "Hoc quidem mirabile auditu est," because: "The noblest organ of the body cannot survive a solution of its continuity and this is the general medical opinion."

Just as the old classical learning of the sixteenth century was regarded by the scholars of the time as a *ne plus ultra*, so also was the knowledge of medicine regarded by the physicians of that period. What progress was made in medicine was an elaboration of the views of Hippocrates, Aristotle and Galen, and an opinion that did not agree with those of the ancient authorities was regarded as heresy.

The idea that wounds of the heart were absolutely and necessarily fatal, established by the authority of Aristotle and Galen, remained unchallenged until the seventeenth century, when there began a period of independent observation and experiment. This characterizes the second period in the history of wounds of the heart. It was the period in which Riolan, Harvey, Morgagni and Larrey made their contributions.

The first to advance the idea that wounds of the heart can heal and that such wounds are not necessarily fatal was Hollerius (1498–1562). The first authentic description of a healed wound of the heart was by Idonis Wolf in 1642. A deer that had been killed in the chase was found to have a healed scar in the heart. This scar was explained as the result of a wound that the animal had received in a previous hunt and from which he had recovered. This observation by Wolf, however, received little attention and it took over a century for this new conception to receive recognition.

Senac in 1749 stated that wounds of the heart are always serious; nevertheless, a non-penetrating wound may heal and may not be fatal. An important advance in the knowledge of the subject was made by Morgagni in 1761 when he pointed out the danger of compression of the heart due to hemorrhage into the pericardium.

The treatment of wounds of the heart during the first half of the nineteenth century consisted of absolute quiet, the application of leeches, venesection, and the passage of a catheter or a sound into the wound for the evacuation of fluid from the pericardial cavity. Dupuytren advised venesection to be carried out almost to the point of exsanguination. Jobert in 1839 stated:

> The duration of life is in proportion to the quantity of blood lost and especially to that which is contained in the pericardium. I have seen death occur promptly in one of these patients, not because of the extent of the wound, but because the blood which has been shed, not being able to escape through the narrow opening in the pericardium, compresses the heart and opposes the accomplishment of its function.

Numerous case reports appeared during the remainder of this period. Cases were compiled, the clinical signs and symptoms were analyzed, and the pathology was studied. In 1868 appeared a comprehensive monograph by Georg Fischer, with a compilation of 452 cases, only 10 per cent of which resulted in recovery.

With the introduction of asepsis during the second half of the nineteenth century the domain of surgery rapidly increased. The first experiments to suture wounds of the heart were performed by Block upon rabbits in 1882, and this begins the third period in the history of wounds of the heart. Wounds made experimentally were sutured, with recovery of the animal, and the feasibility of applying the procedure to the human heart was suggested. The subject, however, was met with opposition. Thus, Billroth in 1883 stated that "the surgeon who should attempt to suture a wound of the heart would lose the respect of his colleagues." Stephen Paget in 1896 stated:

> Surgery of the heart has probably reached the limits set by Nature to all surgery: no new method and no new discovery can overcome the natural difficulties that attend a wound of the heart. It is true that "heart suture" has been vaguely proposed as a possible procedure, and has been done on animals, but I cannot find that it has ever been attempted in practice.

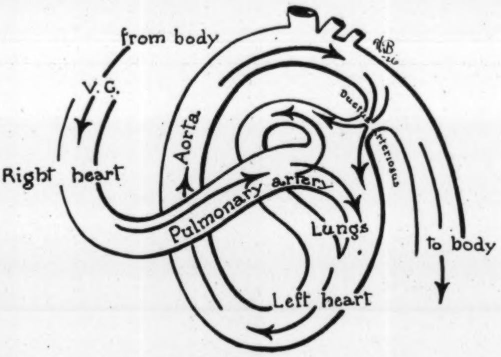
Little support was given to the idea until 1895, when Del Vecchio demonstrated to the Eleventh International Medical Congress at Rome healed wounds of the heart in dogs following suture. Almost within a year from this date three attempts to suture wounds of the human heart were made: The first was by Cappelen of Christiania, September 4, 1895; the second was by Farina of Rome, March, 1896; and the third, which was successful, was by Rehn of Frankfurt, September 9, 1896.

There has appeared in the literature a large number of cases in which wounds of the heart have been sutured. Ten years after he had performed the first successful suture, Rehn compiled 124 cases, in 40 per cent of which the patients had recovered, and in 1920 Tuffier assembled 305 cases, in 50.4 per cent of which the patients had recovered. A surgical procedure was thereby introduced which has decreased the mortality of wounds of the heart about 40 per cent.

Compression of the heart by the collection of blood in the pericardial cavity is the cardinal sign in the diagnosis of wounds of the heart. That the heart may be compressed by the collection of blood in the pericardial cavity and the circulation thereby embarrassed was mentioned first by Morgagni in 1761 and later by Jobert and by Franck. In 1884 Rose coined the term "Herztamponade" and presented cases of wounds of the heart that were fatal, not from exsanguination nor from the extent of the injury itself, but primarily from a compression of the heart by a relatively small amount of blood locked in the pericardial cavity. Experiments by Cohnheim showed that an increased pressure in the pericardial cavity was accompanied by a fall in the arterial pressure and a rise in the venous pressure, and that these phenomena were brought about by the obstruction to the filling of the heart produced by the increased intrapericardial pressure. When this reached the level of the venous pressure, the heart, as shown by Kuno, ceased to function.

What is encountered at the operation of suturing a wound of the heart depends upon several conditions. When the pericardium is opened and the tamponade relieved, the heart usually undergoes several forceful contractions; the circulation is improved, and the patient may regain consciousness. The bleeding from a wound in the auricles, while it may be marked, depending on the extent of the wound, is continuous and usually can be controlled without great difficulty if satisfactory exposure is obtained. If the wound enters the left ventricle or if a coronary artery is severed, the bleeding occurs in spurts that may strike the face of the operator. Matas gives the following colorful description:

> More often the heart's action is violent and tumultuous, and the field of the operation is deluged with blood, which gushes out in intermittent streams, spurting sometimes beyond the wound in the thorax or foaming up into a mass of froth which pours out of the external wound in large quantities. This is especially true of the cases complicated with a large opening in the pleura, which allows the air to rush in and out of the thorax with each respiratory movement and mix with the blood, the heart churning and lashing it into a thick crimson foam which entirely envelops the organ and hides it from the view of the operator. In these imposing circumstances it is impossible to see the wound, much less attempt to suture it. Sponging or mopping is worse than useless. There is but one alternative. The operator must then resolutely do one of two things: he must thrust his fingers into the pericardial sac through the swirl of blood and endeavor to locate the wound by palpating with his fingers and then plugging it with the finger-tips, if he finds it; or he must grasp the heart with his whole hand and drag the bleeding and writhing organ massively out to the thoracic wound, where, by gradually relaxing his grasp, the seat of the hemorrhage will be certainly identified and the suture can be readily applied.



SKETCH OF CIRCULATION SHOWING THE SHORT-CIRCUIT OF BLOOD THROUGH THE PATENT DUCTUS ARTERIOSUS.

After it was shown that suture of a wound of the heart was sometimes a life-saving procedure, a number of methods for the exposure of the heart at operation were described and also methods for placing sutures in the heart itself. These methods of technique, although of importance to the surgeon, will be omitted here.

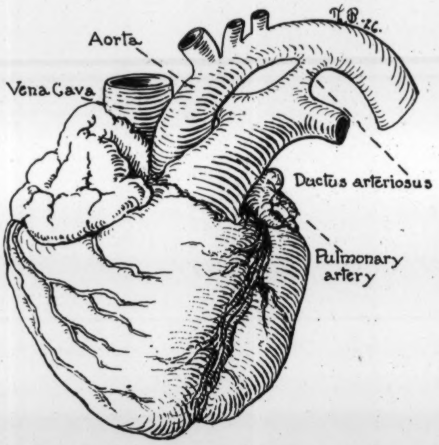
III. UNCOMPLICATED PATENT DUCTUS ARTERIOSUS

It sometimes happens that the ductus arteriosus fails to close after birth. When this happens, blood flows from the aorta where the pressure is relatively high into the pulmonary artery where the pressure is lower. This condition places the heart under a distinct handicap. When the ductus arteriosus fails to close, a part of the oxygenated blood in the aorta is returned to the lungs, whence it enters the left heart to be expelled again into the aorta. It acts like a short-circuit.

Of the many types of congenital cardiac defects, patent ductus arteriosus alone seems to offer promise to surgery. There are cases in which this is the only defect in the circulation and it seems reasonable to assume that if this communication were ligated at operation the heart would be relieved of the handicap. This operation was suggested by John Munro in 1907, but it seems from a review of the literature that ligation of the patent ductus arteriosus has never been carried out.

IV. ADHESIONS AND EFFUSIONS IN THE PERICARDIAL CAVITY

Diseases of the pericardium were noted by the early anatomists. Galen recognized pericarditis in animals and suspected the existence of the condition in man. Rondelet described the pain, dyspnea and syncope of pericarditis, and Riolan, in 1649, recognized the danger of the condition and boldly suggested incision and drainage of the pericardium after trephining the sternum. Senac, a hundred years later, described pericarditis and advised incision and drainage through an intercostal space to the left of the sternum. Morgagni, in 1761, described the danger of effusion into the pericardial cavity due to compression of the heart, but declared that the day was distant when the ability to recognize the condition would justify paracentesis. Corvisart, in 1806, referred to the uncertainty of making the correct diagnosis as prohibiting either incision or puncture of the pericardium. The precordial bulge and the increased area of percussion dullness associated with pericardial effusion, discovered by Auenbrugger and published by Corvisart in 1811, were important signs in the recognition of the disease, but the difficulties besetting the diagnosis were indicated by the fact that Laënnec (1819) doubted the possibility of making a correct diagnosis and, therefore, did not attempt paracentesis.



SKETCH OF HUMAN HEART SHOWING THE PATENT DUCTUS ARTERIOSUS.

The operation of paracentesis, up to this period, was either advocated or opposed on theoretical grounds. The merit of the procedure must have received some appreciation, but two obstacles stood in the way of its performance; namely, the difficulty of making the correct diagnosis and the fear of injury to the heart, an organ that was held sacred and not to be touched. Owing to this fear only two attempts were made to drain the pericardial cavity; Desault, in 1798, utilizing the method described by Senac, incised and drained an encysted pleurisy, and Larrey, in 1810, performed a similar operation, but the diagnosis again was in error. According to Larrey, the first wound of the pericardium to recover was one in which he inserted a catheter and evacuated from the pericardial cavity three beakers of wine-colored fluid, and after the passage of a sound obtained four more beakers of similar fluid.

Romero, in 1819, performed the first successful pericardiotomy. He operated in three cases of pericarditis with effusion, in two of which the patients recovered. Through an incision made in the left fourth interspace near the sternum, the distended pericardium was felt with the finger, picked up with the forceps and cut with scissors. Jowett, in 1827, punctured the distended pericardium with a trocar, but the fluid escaped into the thoracic cavity from which it was absorbed. With the exception of an attempt by Schuh to tap the pericardial cavity in a case that proved to be a mediastinal tumor, no other cases were recorded until 1841, when an extraordinary series of successful cases was reported by Karanaeff following an outbreak of scurvy in Kronstadt, Russia.

The first operation for suppurative pericarditis was reported by Hilsmann. The pericardium was exposed and opened through an incision made in the fourth interspace. Langenbeck, in 1850, similarly incised and drained in a case of purulent pericarditis.

Following a discussion of the subject by Trousseau, in 1854, in which several cases of incision and drainage of the pericardium were reported, the efficacy of the procedure became more clearly recognized, although this recognition did not gain general accord. The latter is shown by a statement by Billroth, in 1870, characterizing the operation of tapping the pericardium as a surgical frivolity and a prostitution of surgical skill. Nevertheless, the operation thereafter was performed more frequently, and a large number of reports on the subject can be found in the literature. Following the influence of Dieulafoy, in 1873, aspiration of the pericardium supplanted the method of open incision and drainage, and since that time this method of treating cases of serous effusion has become the one of common practice. Tapping the pericardium with a needle, however, is a blind procedure. Accidents following injury to the heart may occur, and, indeed, furnish a strong argument for the opening operative method.

Adhesions over the surface of the heart may impair its function much as a glove may limit the free movements of the hand. In some cases the systole of every heart-beat is partially spent in a tug upon the unyielding chest wall. For the relief of this condition Brauer proposed an operation which is, in general, attended with good results. It consists of the removal of several ribs from the area of the chest wall that is tugged upon by the heart. The unyielding chest wall thereby becomes pliable and can move with less resistance in unison with the movements of the heart.

V. VALVULAR DISEASE OF THE HEART

The popular dictum of Sir William Osler may be modified to read: *Man is as old as his arteries and as useful as his valves.* After it was shown that the heart could tolerate operation, the question was presented whether surgery could be applied in the treatment of various valvular defects. In 1898 Samways, an English veterinarian, "anticipates that with the progress of cardiac surgery some of the severest cases of mitral stenosis will be relieved by lightly notching the mitral orifice." At about the same time Arbuthnot Lane, an English physician, tried to select a case that would be satisfactory for the procedure. In 1902 Sir Lauder Brunton stated that "the good results that have been obtained by surgical treatment of wounds of the heart emboldens one to hope that before long similar good results may be obtained in cases of mitral stenosis." Sir James McKenzie gave the proposal careful consideration, but felt that he "would rather leave the troubles and the dangers for others." The proposal provoked a storm of criticism. It was claimed by some that rheumatic heart disease was essentially a disease of heart muscle and that the valvular element was of secondary importance. This may be true in certain cases, but there are undoubtedly cases of mitral stenosis in which the mechanical obstruction is the dominant feature and in which the myocardium is relatively intact. But chiefly the technical difficulties besetting the proposal were enumerated as making its successful accomplishment impossible.

It is an accepted fact that the heart can make a better adaptation to mitral insufficiency than it can to mitral stenosis. Patients with mitral insufficiency may live to an old age, but patients with mitral stenosis usually die early and usually before the age of forty. To excise a piece of the stenosed ring would decrease the obstruction but at the same time it would increase the leak. Could the function of the heart be improved by such a change in the mechanics of the circulation? If the circulation can be improved by decreasing the degree of obstruction, mitral stenosis will offer promise to surgery. In the words of Dr. Harvey Cushing: "The mitral valve may become the gate-way to the last great Northwest of surgery."

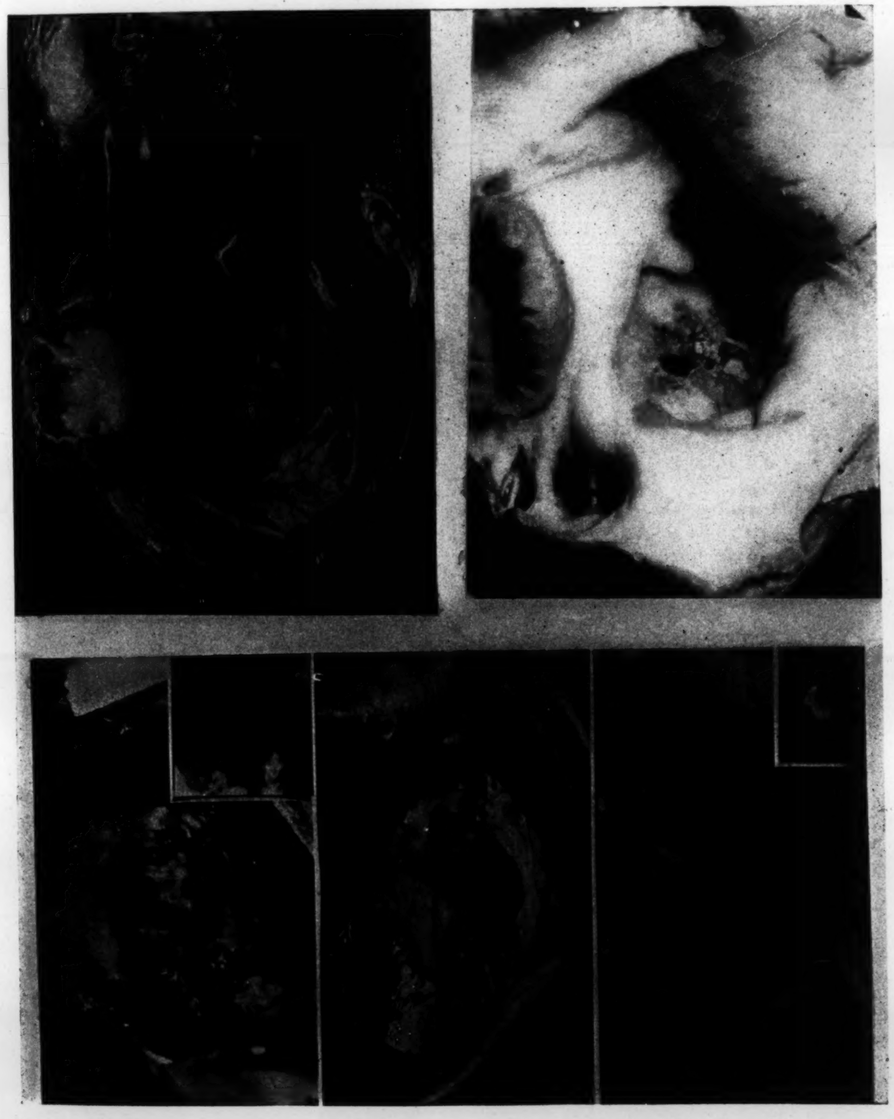
A few attempts to relieve valvular defects in the human heart are recorded in the literature. An attempt to stretch a stenosed aortic valve by introducing a finger into the stenosed ring through the invaginated wall of the aorta was carried out by Tuffier in 1912. A second was by Doyen who attempted to section a stenosed mitral valve, but death was due to a lesion made in the interventricular septum. Recently an attempt to relieve mitral obstruction was carried out in St. Louis, but the case was fatal at operation.

The medical literature gives comparatively little help in answering the question. The only definite evidence in its support is the fact that the heart makes a better adaptation to a mitral leak than it does to a mitral obstruction. This evidence is of importance, but before attempting to relieve the mitral obstruction in the human heart the problem should be carried to the laboratory. To produce mitral stenosis in dogs, to observe the resulting incapacity of the heart, to relieve the mitral obstruction at operation and to observe the resulting improvement in the health of the dog was a desire that recently lent stimulus to the performance of many experiments in the laboratory.

It is apparent that physiological experiments have little or no application in establishing the basic idea. Pressures in the various chambers of the heart have been determined after placing a stenosing ligature at the mitral valve and also after relieving the ligature and producing an accompanying regurgitation. These determinations, however, have no application to the problem, because the all-important element of compatibility with life is lacking. Acute experiments do not give information that is applicable to the question.

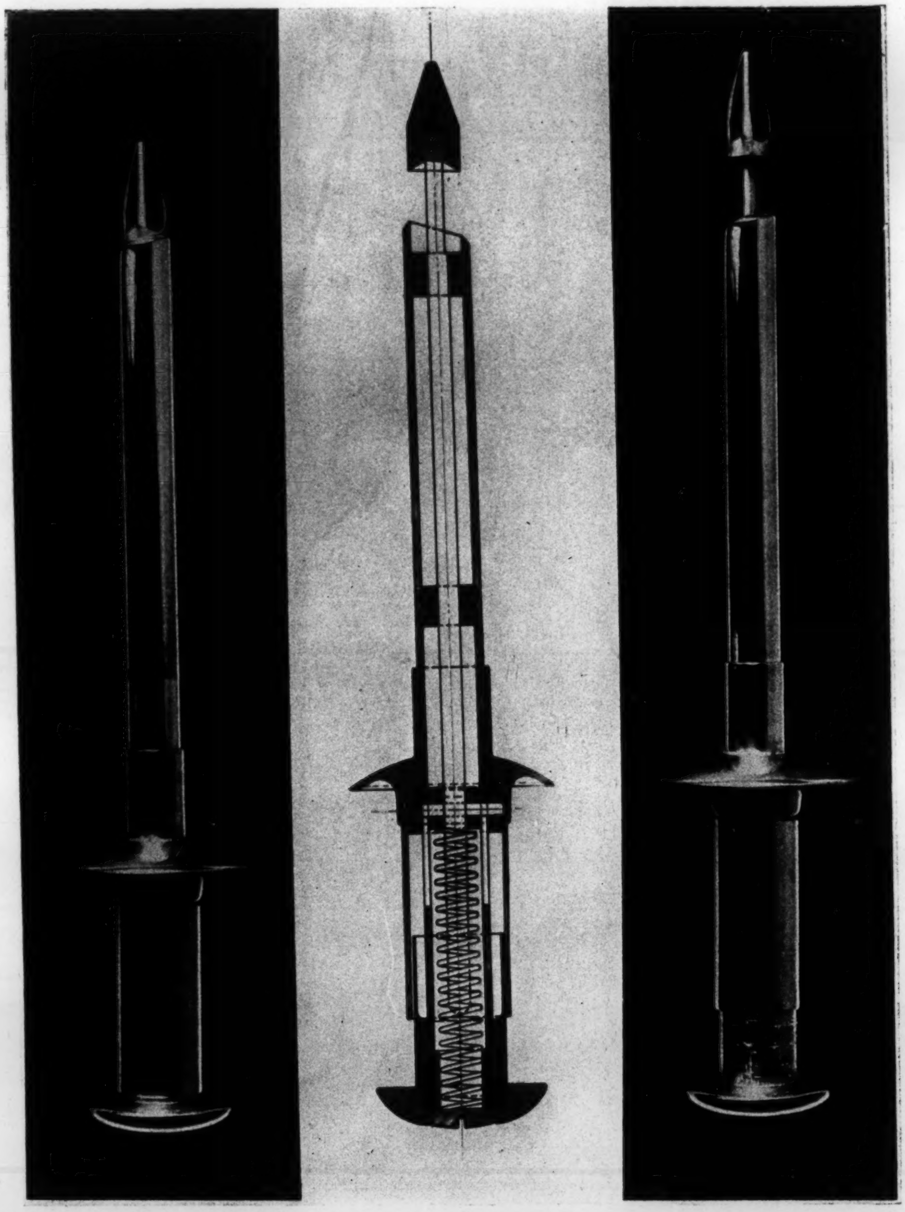
With the failure to produce mitral stenosis in animals, the basic idea remains undemonstrated. Are patients suffering from mitral stenosis, therefore, jutifiably subjected to operation for its relief? The question was answered in the affirmative by Dr. E. C. Cutler. He, with the collaboration of Dr. S. A. Levine and the writer, having accepted the idea as a working hypothesis, set out to give it application.

Five cases of mitral stenosis were operated upon. One of these is still living, almost three years after operation. Signs of mitral stenosis persist, but it seems that the general condition was slightly improved. In the first three cases a slender tenotome knife was inserted through the wall of the left ventricle and attempts were made to incise the stenosed valve. The experience afforded by these cases demonstrated the inadequacy of the method. When the condition of the stenosed valve is considered, the degree of obstruction, the thickness of the valve, its fibrous and often calcareous condition, it is apparent that such a valve, if valve it may be called, cannot be sectioned satisfactorily by a force applied to a knife several inches from the cutting edge, without the aid of counter-pressure applied to the valve at the point where the section is to be performed. It seems, furthermore, that a slit-like cut in the markedly thickened valve, on account of the stiffness and the rigidity of the incised margins, may relieve the functional obstruction but little, and the excision of a piece from such a valve is almost a necessity if the obstruction is to be relieved. It seemed essential, therefore, that a powerful cutting device should be employed that would actually excise a piece from the stenosed ring and remove the piece from the blood stream. For the accomplishment of this aim a special instrument called a cardiovalvulotome was devised. This instrument was used at operation in two cases of mitral stenosis. In one case a piece of the stenosed valve was excised and actually removed from the blood stream. In the other case difficulty was experienced in orienting the instrument in relation to the stenosed valve and again inadequacy of method was demonstrated. *Important surgical procedures can be carried out with safety only under the guidance of the eye.*



Human Hearts Showing Stenosis of the Mitral Valve as Seen from the Auricle. The Valve Leaflets are Rigid and Lie Horizontally, Producing an Obstruction to the Flow of Blood. In the Upper Right a Synechia Extends from One Leaflet to the Other. The Cardiovalvulotome Is Inserted through the Mitral Valve in the Lower Photographs; the Inserts are Roentgen-ray Films and Show the Presence of Calcium in the Valves.

So again the question becomes a matter of method and instrument. Unlike the reaction excited by the original proposal of Samways, Lane and Brunton at the beginning of this century, the medical profession today accepts with kindly interest these attempts to relieve mitral stenosis by surgery. It is incumbent upon the physician to give this question most careful consideration. If the hypothesis be correct it may become the basis for the development of another surgical specialty. The subject presents surgery with conditions with which it is rather unfamiliar, namely an organ that is vigorously pulsating, and a medium that is under pressure and opaque to light. These technical problems should be capable of solution, as were problems in the past, by methods, instruments and gentleness.



The Cardiovalvulotome, an Instrument That Was Devised to Excise a Segment from the Mitral Valve. This Instrument Was Used at Operation upon Two Human Cases. The Cutting Edges Show the Shearing Principle. By Telescoping the Handle the Cutting Edges Over-ride so that the Distal Portion Cups into the Shaft. The Excised Segment of Valve is Removed from the Blood Stream in the Instrument.

BIBLIOGRAPHY

BALLANCE, C. A. The Surgery of the Heart (Bradshaw Lecture, 1919). N. Y., 1920.

FISCHER, G. Die Wunden des Herzens und des Herzbeutels. *Arch. f. klin. Chir.*, Berl., 1868, IX, 571.

ROSE, E. Herztamponade (Ein Beitrag zur Herzchirurgie). *Deutsche Ztschr. f. Chir.*, Leipz., 1884, XX, 329.

CUTLER, E. C., LEVINE, S. A., and BECK, C. S. The surgical treatment of mitral stenosis: experimental and clinical studies. *Arch. Surg.*, Chicago, 1924, IX, 689.

CUTLER, E. C., and LEVINE, S. A. Cardiotomy and valvulotomy for mitral stenosis. *Boston M. & S. J.*, 1923, CLXXXVIII, 1023.

BECK, C. S., and MOORE, R. L. The significance of the pericardium in relation to surgery of the heart. *Arch. Surg.*, Chicago, 1925, XI, 550.

TEACHERS AND TEXTBOOKS OF MEDICINE IN THE MEDIEVAL UNIVERSITY OF PARIS

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MEDICAL learning in every period is well represented in the persons of outstanding teachers and in the books which were widely read; around this skeleton we can well weave the structure of that learning. As we approach our own times this framework becomes more and more complete; we have also many other sources to rely upon which are as much, or more, illuminating than the knowledge of the chief books of the period used as school texts. For the Middle Ages, however, our main source of information lies in these texts and in the personalities of the men who expounded them. Medicine centered not in hospitals, not in laboratories, but in libraries. On the shelves of those libraries were the important textbooks which contained everything that was known or even that was knowable of the human body and its ailments, and this information they contained in the most authoritative form.

We shall examine the textbooks in use during the first two centuries of the life of the Faculty of Medicine of Paris. That Faculty was the most representative of all medical Faculties of the Middle Ages, representative on account of its dogmatic authoritativeness and its scientific handling of matters medical, the word "scientific" used in the medieval sense.

The first record of books which were probably in the hands of Parisian students is the Gonville and Caius MS: "Sacerdos ad altare accessurus," described by Haskins and attributed by him to Alexander Neckam (1157–1219).[1] The list, set up probably around the year 1190, contains the "Isagoge" of Johannitius, the "Aphorisms" and "Prognostics" of Hippocrates, the "Tegni" (τέχνη) of Galen and the "Pantegni" mentioned as Constantine's but written by Ali-ibn-el-Abbas, the so-called "Viaticum Constantini," the books of Isaac, the "Libri urinarum" and "Libri pulsuum" (probably those of Theophilus Protospatharius[2] and Philaretes respectively), the pharmaceutical works of Alexander of Tralles, Dioscorides and the Macer Floridus.[3] The gist of these was included in the Salernitan "Antidotarium Nicolai" and their distinctness here is the only point that speaks against the purely Salernitan origin of this list. But as Dioscorides was well known to St. Isidore[4] and thus relied upon by Hugo of St. Victor, we can derive his presence from the other great channel of classical transmission other than the one passing through Salerno, to wit the pathway Classical Antiquity-St. Isidore-Rabanus Maurus-Hugo of St. Victor-Paris. The rôle of this transmission has been pointed out elsewhere.[5]

Concerning the "Viaticum": It is known, from the publications of Dugat[6] and Daremberg[7] that this work has Abu-Jafar-Ahmed for its author and was called originally Zâd-el-Mouçaffir. The author was very widely famed[8]: a threnody was written to him by a moallad poet and his name was known everywhere in Islam.[9] The book thus was very popular. It is what its Latin name implies, a help for travelers, containing much sound advice, e.g., concerning the treatment and prophylaxis of rabies.[10] On the therapeutic side it is a decided progress against the ancients, introducing sugar (σάκχαρ) and a number of new drugs which were not known to antiquity, such as ricinus (Kher-w'a)[11] which was derived from the Orient, and extolling the anodynic virtues of poppy seeds and so forth. As a pharmacopoea it is a forerunner of the "Antidotarium." The mother of therapeutic wisdom, Salerno, was strongly indebted to the Arabs. Some of the recommendations of the "Viaticum" were extensively used: the prescriptions of vinegar, onions and mustard, laxatives like fructus colocynthidis,[12] the use of river crabs and so forth were much in vogue as the famous plague prescriptions 150 years later are witness.[13] Fantastic psychotherapeutic suggestions appear for "love" which is "one of the diseases that are born in the brain": "Combat it by thinking, drinking, singing, by entertaining and being entertained, by reading poetry, by looking upon water, gardens, foliage and new faces."[14] How well this harmonized with medieval sentimentality, which conceived of love as a definite disease:

Pallor, singultus, macies,
Suspiria, jejunium,
Haec est amoris acies
In castris militantium.[15]

The symptomatology is fairly clear, characterizing the work of the early Arabs who were good observers. But when we come to etiology we are enveloped in a maze of Galenic theories: the quatrihumoral doctrine is of course very elaborate. And this curious Arab trait, the combination of personal observing powers, necessarily free, with the constant bowing before authorities, is evident in this book in which so ample reference is made to Galen, Hippocrates and Dioscorides (*inde ventus* in therapeutics), Paul of Aegina, Mesue and Rhazes.[16]

It is to be noted that the Arab authors referred to here are what may be termed the early Arabs (Abu-Jafar-Ahmed died in 1004, Ali-ibn-el-Abbas in 994) together with Serapion the Elder, Ibn-Joljol and Rhazes. Ali-ibn-el-Abbas, however, contributes nothing but his "Al-Malaki" at this stage, the later so popular Rhazes nothing but his "Ad Almansorem"; the "Continens" (al-Hâwi) was translated a century later by Faragut.[17] It seems possible to distinguish in a marked way these from the late Arab authors whose prototype is Avicenna; speculation dominates very much as centuries progress. And in Avicenna, who curiously enough was not used till late in the thirteenth century although first translated by Gerard of Cremona in 1149, and in Averroës, the exponent of a still later age, the system of medical rationalism will become complete.

The first official record of books studied dates from 1274,[18] in the decade following 1270, so rich in innovations, reforms and definite regulations concerning academic life.[19] At this time the Faculty was endowed by Pope Honorius III with official privileges; its machinery was fully functioning. This first official list does not differ substantially from the one contained in the Gonville and Caius MS which is nearly a century older. We find the books of Ysaac ("Liber urinarum," "Liber febrium," "Liber diaetarum universalium" and "Liber diaetarum particularium"), the "Viaticum Constantini," the "Pantegni," Philaretes, Theophilus and added to these, although not made compulsory reading, the "Versus Aegidii." These of course are the popular didactic poems of Gilles de Corbeil, written between 1190 and 1220, the "De pulsibus," "De urinis," "De laudibus et virtutibus compositorum medicaminum" and "De signis et sinthomatibus egritudinum." These books are, in essence, representative of early Arab (Constantinian) lore, to a great extent pure Galenism with few original Oriental additions. In the "De laudibus" and "De signis," however, we can find much new material. It is, in face of this, a curious fact that of all Gilles' books these two were the least popular, as the scant number of extant MSS testifies, as compared with the great number of MSS of the other poems scattered all over Europe.[20] Classical authors in the list include Galen, with the "Megatechni," and although Hippocrates is not specifically mentioned, it is certain that his "De Regimine Acutorum Morborum," "Prognostics" and "Aphorisms" were perused, for we know that Constantine the African translated the latter[21] and the whole set of books, as enumerated above, bears his stamp. The so-called books of

Ysaac were attributed by many to Ishaac-ben-Amrân,[22] by others to Ali-ibn-el-Abbas.[23] The question of authorship, however, is not important, for both of the possible authors were diligent commentators of Galen and Hippocrates and both belong to the group of the "early Arabs." The work, which contains nothing but Galenic doctrine, passed as a whole through Constantine's hands; the question of authorship has no bearing upon the doctrines.[24]

The same uncertainty attaches to the "Pantegni" or the "Al-Malaki" (Liber regalis),[25] although Ali-ibn-el-Abbas is generally recognized as the author. This is an extremely characteristic book and its popularity is well accounted for by the following typically illustrative passage: "Hypocratis et Galieni testimonium qui in hac priores arte floruerunt maximeque regule et norme propositionesque quibus sillogistici et rationales utuntur et super eos surgit nostra constructio et in sanitatis custodia et in morborum medela."[26] (There stands the authority of Hippocrates and Galen who flourished early in the practice of this art and there are the supreme rules, norms and propositions which are utilized by dialecticians and men of reason; and it is upon these that our edifice, dealing with the preservation of health and cure of diseases, rests.) Here then is the complete essence of medical scholasticism. The foundation is formed by norms and propositions and the dialectic method is hinted at. But let us note that the idea of preventive medicine is expressed; one of the purposes of the book is avowedly the conservation of health. This concept is a medieval achievement without doubt.

It is interesting to see how this bulk of Constantinian work was kept together, although there undoubtedly existed better translations, such as that of the "Pantegni" by Stephen of Antioch, of 1127.[27] That is why I feel entitled to call this group of Arab works the "Constantinian Corpus"; it was handed down from generation to generation conscientiously in MSS, and after the fifteenth century in printed books, always in the same codices, always in the same incunabula and other early editions, despite the protest of Thaddaeus of Venice, who violently criticised the value of these translations.[28] "Pessima, defectiva, superflua [sunt]!" Rightfully does Constantine the African appear in the foreground of Bourgeois' mural painting in the amphitheatre of the Faculty: he truly did preside over medical Paris in the Middle Ages![29]

A century passed before another list of texts was issued, for the document regulating the prices of books, dating from 1304, contains none of the medical authors.[30] The philosophical works enumerated there were undoubtedly in the hands of the medical students, too, who were required to undergo a severe grind in Aristotle.

We might try to fill this long period between 1274 and 1395 by considering the teaching of some prominent scholars who graced the University in this century. One of these was Géraud de Berri (Giraldus Bituricensis[31]). His chief works are the Commentaries to the "Viaticum Constantini,"[32] in seven books and the "Summa medendi" which in turn was commented upon by Bernard of Gordon, a Montpellier scholar of the late thirteenth and early fourteenth century.[33] The latter work ("Summa medendi") begins with the Aristotelian precept: "Cum omnis scientia ex suo fine et utilitate sua sit appetenda. . . ." The books are based upon the standard classical and Arab authors, including also Johannitius (Hunein-ben-Ishaak), Theodorus Priscianus and Alexander of Tralles, the pharmaceut. There are observations in the "Commentum super Viaticum" which may permit us to recognize gonorrheal urethritis and which seem to be original with this author,[34] as is also the idea of radical therapy (emasculation) for hernia. Another master flourishing late in the thirteenth century was Alebrand of Florence,[35] relying upon the favorite Arabs of whom he constantly quotes Johannitius, Isaac, Serapion the Elder and Rhazes, and also the master of the later ones, Avicenna, with the inevitable Constantine. It is obvious that it is through the latter that Alebrand got acquainted with the Arabs and with Galen. He leans very strongly upon Isaac's "Diets," a book which was responsible for the concepts of preventive medicine. Alebrand says in a late MS: "L'une partie si est garder le cors tot ausi le bien sain com le mal sain generaument, si com dist Constantins," a reference most probably to Isaac. Did not the Arabs after all first formulate this idea, so well received in the Middle Ages?

Other famous teachers are likewise known from their works, as Petrus Aponensis (Pietro de Abano),[36] the author of the very popular "Conciliatores" (a typical scholastic work endeavoring to settle the differences between the various authorities, acting upon the principle that *Verum vero contrarium esse non potest*, applying elaborate dialectical methods), John Passavant, Lanfranc of Milan, the surgeon.[37] These were Italians, but we also meet Englishmen like Nicholas of Farnham, successively professor in Bologna and Bishop of Durham,[38] and Gilbertus Anglicus, an important commentator on Gilles de Corbeil,[39] as well as Spaniards and Portuguese like Petrus Hispanus (later Pope John XXI, 1276–1277), the author of the renowned "Thesaurus Pauperum."

The fourteenth century saw the rise of the great surgeons; Henri de Hermondeville, Lanfranc and Guy de Chauliac, all connected with Paris.[40] Their knowledge, however, was derived from sources different from those of the physicians; their working methods, too, were at variance with the accepted medical procedure and their position was not entrenched in the Faculty of Medicine. Although it was undoubtedly they who injected new blood into medical thinking, we have to omit their discussion. Empiricism was abroad among them; they did not officially belong to the Faculty; they led a somewhat freelance existence. They are not an organic part of medical learning in the University. Similar excuse has to be made for omitting Arnaldo de Vilanova, for, except for some unpleasant personal experiences[41] this famous Catalan scholar had no academic connection with Paris. His presence there was purely political. His manifold activities, ranging from translating and commenting classical, Arab and Salernitan works up to iconoclastic philosophy and theology, centered in Spain.[42]

We arrive now at the list of textbooks issued in 1395.[43] This catalogue is somewhat different from the one a century older. It contains the "Canon" of Avicenna (second and third *Fens*), various commentaries on this, the "Antidotarium clarificatum" of Nicholas Myrepsus, the book of Mesuë the Younger, the "Colliget" of Averroës, the whole "Continens" of Rhazes, the "Clavis Sanationis" of Simon Januensis, the "Concordantiae" of Petrus de Sancto Floro, several books of Galen, the "Antidotarium" of Albucasis and the "Concordantiae" of John of St. Amand.

The "Canon" of Avicenna is a complete rationalized system of Galenism, as is Averroës' "Colliget," to a still greater extent. The Younger Mesuë, a Mesopotamian Christian, was a pupil of Avicenna in Bagdad,[44] whose "Antidotarium" (el-Ecrâbâdin) represents one of the latest products of "early Arabism." Simon Januensis[45] was a Genoese physician who lived in Rome, was patronized by Pope Nicholas IV and died around A.D. 1300. He translated numerous Arab treatises (Abu-'l-Qasim, and the books of Serapion[46]) and wrote "Clavis Sanationis,"[47] a popular pharmacognostic treatise, cataloguing "Latin, Greek and Arabian medicaments," much on the order of the omnipresent Salernitan "Antidotarium" and of Nicholas Myrepsus.[48] This latter, a Byzantine physician, flourished around 1280 and was the author of a pharmaceutic treatise, forty-eight chapters strong, which was translated into Latin in the fourteenth century and fused into one comprehensive whole work, together with the Salernitan "Antidotarium" (Nicholai

Praepositi) by one Rheginus. The "Antidotarium clarificatum" listed above probably means this consolidated Graeco-Arabian work. The only other Byzantine medical author studied was Johannes "Actuarius,"[49] physician-in-ordinary to Emperor Andronikos III (1328–1341). His works[50] are based completely upon Galen, Aëtius and Paul of Aegina.[51]

John of St. Amand, the *doctor suavissimus*, canon of Tournai and provost of Mons, the author of the "Concordantiae," flourished in the second half of the thirteenth century.[52] His ideas, as expressed in that work and in the comments called "Areolae super Antidotarium," also in the "Tractatus de necessitate compositionis medicinarum" embody the premises and methods of medical scholasticism at its height.[53] Authorities are freely recurred to: "*Dicit Galienus*" is the formula accompanying every aprioristic assertion. In defining qualities of medicaments it has to be established whether they are hot or cold and to what degree, for only then is the "substance" which determines the pharmacological action known. And as the pathology is built upon the quatrihumoral theory, so is the action of therapeutic agents quatrifold.[54] Four conditions are necessary to produce that action: *digestio*, the Galenic *coctio* (πέψις), *evacuatio*, *restauratio*. The general operations of medicinal agencies have to be distinguished from the "proper," special ones, the general operations being congelation, putrefaction, digestion, aperient, and so forth, whereas the proper actions are classified as action on the head, the chest and so forth, according to the regions of the body. This classification is very extensive and elaborate. The principles of reason are contrasted with those of experience, reason being a function of intelligence, experience that of the senses, and the senses are fallacious as all authorities state and confirm, from Hippocrates to Hugo of Saint Victor and St. Thomas Aquinas. The method is dialectics, with plentiful application of syllogisms, without taking recourse or without deeming it necessary to do so, in experience, in observation. The traditional lore is here expounded with all the arts of the logician, the tradition of the classics and Arabs, beginning with the four humors to the *similia similibus*,[55] the directive standard of therapeutics, the familiar old unalterable principle.

These then are the most important textbooks that were studied in the University during the thirteenth and fourteenth centuries. Although it is conceivable that others were utilized besides, these are the ones officially listed in documents embodied in the chartulary of the School and can therefore be regarded as absolutely representative of the studies in the medical curriculum. It is clear from these lists, and also from what we know of the teaching of outstanding men, that medical learning in Paris was dominated by Constantinian Arabism in the thirteenth century and additionally, by Post-Constantinian Arabism (produced through Western translators) in the fourteenth century.

REFERENCES

1. Haskins, C. H. Studies in the History of Mediaeval Science. Cambridge, Mass., 1924, p. 356.
2. Protospatharios to Emperor Heraklios in the seventh century. Krumbacher, K. Geschichte der byzant. Litt. München, 1897, p. 614.
3. Manitius, M. Geschichte der lateinischen Litteratur des Mittelalters. Münch., 1923, II, 539.
4. De remediis et medicaminibus, Migne, Patr. Lat. V, LXXXII, col. 193.
5. d'Irsay, S. *Janus* (in press).
6. Dugat, G. *J. Asiat.*, 1853, 5 s., I, 289–353.
7. Daremberg, C. Notices et extraits de manuscrits médicaux grecs, latins et français. Paris, 1853, pp. 63–100.
8. Wüstenfeld, H. F. Geschichte der arabischen Ärzte und Naturforscher. Götting., 1840, p. 60. Leclerc, Hist. de la méd. arabe. Par., 1876.
9. According to the biographer Ibn-Abi-Oseibia, Dugat, G., *loc. cit.*
10. Viatic. VII, c. 13, Dugat, G., *loc. cit.*
11. Viatic. VII. De dolore cranii. The word Khirwa, is of Arabic origin according to most lexicographers, as Lane, Arabic English Lexicon, London, 1863, I, 725. It occurs at least as early as the Siháh (A.D. 988) in connection with its power of loosening the yellow bile. The Siháh is contemporary with the Zad el Mouçaffir, *vid. supra.*

For kind suggestions I am indebted to Professor Popper, University of California.

12. Viatic. vii, 13.
13. d'Irsay. Ann. Med. Hist., N. Y., 1925, vii, 220.
14. Viatic. i, 20.
15. Du Méril Poésies populaires latines du moyen age. Par., 1847, p. 224. Hesiod. Theog., 121–122. Dugat quotes a little poem of Hégésippe Moreau.
16. Daremberg, C. *Loc. cit.*, ms cod. 2239, fol. 6.
17. Wüstenfeld, H. F. Die Übersetzungen arabischer Werke in das Lateinische. *Abh. d. kgl. Gesellsch. d. Wsch.*, Göttingen, 1877.
18. Chartularium Universitatis Parisiensis. Ed. by Deniflé and Chatelain, i, 453.
19. *Ibid.*, i, 452, 453, 454.
20. Vieillard, C. Gilles de Corbeil. Paris, 1909.
    Rose, V. Egidii Corboliensis Viat. Leipz., 1907.
    d'Irsay, S. The life and works of Gilles de Corbeil. Ann. Med. Hist., N. Y., 1925, vii, 362.
21. Hippocratis Aphorismorum liber cum Galeni commentario interprete Constantino Africano etc. with the Libri Ysaac in ms. Montpellier, Bibl. Dép., i, 356, No. 182.
22. Died Hej. 183, a.d. 799. Wüstenfeld, H. F., *Op. cit.*, 1840, p. 32; Note 17, pp. 1–133.
23. A view held widely in the Renaissance. The identity of authorship of the "Libri Isaac" and "Pantegni" was held by Simphorianus Camperius. Wüstenfeld, *Op. cit.*, 1877, p. 14, based on: "quod utrumque explanabimus in nostro libro Pantegni," in Liber febrium. *Vid.* Thierfelder, J. G., *Janus*, 1846, i, 685.
24. Viaticum Ysaac, in septem partitum libros, quod Constantinus Africanus, montis Cassinensis monachus latinum fecit etc. Lyon, 1515. The Pantegni and the Viaticum proper (Abu-Jafar-Ahmed's) are printed together here and in most other editions. mss in Oxford, Paris, Montpellier, Tours, Bruges, Leipzig.
25. Wüstenfeld, H. F. *Op. cit.*, 1840, p. 59.
    Neuburger, M. Geschichte der Medizin. Stuttgart, 1911, ii, 176, 210.
    Browne, E. G. Arabian Medicine. Camb., 1921.
26. Ali-ibn-el-Abbas. Lyon, 1523.
27. Haskins, C. H. *Op. cit.*, p. 131.
    Neuburger, M. *Op. cit.*, ii, 176, 210; mss in Berlin, Erfurt, Basel, Cesena, Worcester, Cambrai, Leipzig, Paris (Bibl. nat.)
28. In 1517; Daremberg, C. *Loc. cit.*
29. On Constantine the African. Thorndike, L. History of Magic and Experimental Science. N. Y., 1923.
30. Chart. Univ. Paris, ii, 642. The pseudo-Aristotelian Physiognomica is listed.
31. Littré, E. In Hist. litt. France. xxi, 404.
    Astruc, Histoire de la faculté de Médecine de Montpellier. Paris, 1767, p. 170.
32. Commentum super Viaticum cum textu. Venice, 1507; Littré, E. *Loc. cit.*
33. Author of the well-known "Lilium Medicinae."
34. "Virga patitur a coitu cum mulieribus immundis ex spermate corrupto, vel ex humore venenoso in collo matricis recepto; nam virga inficitur et aliquando totum corpus." (Book vii: De ulceribus.) Littré, E. *Loc. cit.*
35. Chévalier, *Répert. Bio-bibl.*
    Littré, E. *Op. cit.*, xxi, 415.
36. Daunou, P. C. F. Hist. litt., xvi, 95.
37. Daunou, P. C. F. *Loc. cit.*
    Tiraboschi, G. Storia della letteratura italiana. Milan, 1823, iv, 323, 354. *ibid. cit.* Sarti, De Prof. Bonon. i. 448.
38. Tiraboschi, G. *Loc. cit.* He was one of the dissenting scholars in 1229, the critical year in the life of the young University. Chart. Univ. Paris, i, 62.
39. Daunou, P. C. F. *Loc. cit.*
40. Malgaigne, J. F. Oeuvres complètes d'Ambroise Paré. Paris, 1840, i, cxx.
41. Chart. Univ. Paris, ii, 615, 616, to the years 1299–1300.
42. Menendez. y Pelayo. Historia de los heterodoxos españoles. Madrid, 1918, iii, 179.
    Arnaldo de Vilanova. Madrid, 1879.
    Lalande, Arnauld de Villeneuve, sa vie et ses oeuvres. Paris, 1896.
    Diepgen. Arnald von Villanova. Berl., 1909.
43. Chart. Univ. Paris, iv, 1723 (Nov. 22, 1395).
44. Wüstenfeld, H. F. *Op. cit.*, 1840, p. 63.
45. Tiraboschi, Storia della lett. ital. iv, 751; iv, 334.
    Daunou. In Hist. litt. France, xxi, 241.
46. Wüstenfeld, H. F. *Op. cit.*, 1877, *et al. loc.*
47. Editio princeps: Simonis Januensis Clavis Sanationis (Sanitatis) seu Synonima Medicinae. Milan, 1473, fol.
    Panzer, G. W. *Ann. typogr.*, ii, 14, 336; iii, 237.
48. *μύρεψος*: meaning preparer of ointments. Krumbacher, *op. cit.*, pp. 263, 615, 617.
49. With the exception of a few early ones, like Theophilus Protospatharios. *Vid. supra.*[2]
50. Περὶ οὔρων and Περὶ ἐνεργειῶν καὶ παθῶν τοῦ ψυχικοῦ πνεύςατομ καὶ τῆς καιαύτὸ διαίτης.
51. Krumbacher, *Op. cit.*, pp. 263, 615, 618.
52. Littré, E. *Op. cit.*, xxi, 254.
53. Die Concordanciae des Johannes de Sancto Amando. Edited by J. L. Pagel, Berlin, 1894.
54. *E.g.*, the relation between the quatrihumoral theory, and therapeutics: "Ad recuperandam loquelam, recipe theodoriscon cum modico diacastorei, quibus mixtis fricetur palatum et attrahet flegma a capite."
    Sprengel, K. Histoire de la médecine. ii, 413.
55. *E.g.*, the absurd prescription: crocodile-fat should be applied to a part bitten by the crocodile; attraction of the "venom" is hoped for!

THE USE OF THE UNICORN'S HORN, CORAL AND STONES IN MEDICINE

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EDINBURGH, SCOTLAND

UNICORN'S HORN

MANY things which were precious, rare or difficult to obtain were in past days deemed to possess some special curative property. It is easy, therefore, to understand why the horn of this animal came to be employed in medicine. Not only was the animal rare, but it dwelt in inaccessible places, and when provoked was fierce and formidable. To secure its horn was an undertaking of much time, trouble, danger and expense. The value that was attached to supposedly veritable examples of unicorn horns even in comparatively recent times was very great. During Queen Elizabeth's reign there was one at Windsor Castle which was valued at £10,000; in 1665 one was sold in Russia for £6000. Indeed the article was so costly that it could only be employed as a medicine for the rich. Unicorns' horns were sent as royal gifts: thus the Venetian senate presented one to Solyman, "The Magnificent," Sultan of Turkey (*ca.* 1560); while Pope Clement VII made a gift of one set in a silver stand, to Francis I, king of France.

There are several allusions to the unicorn in the Scriptures, where it is taken to represent power or strength. It is more than likely, however, that there has been a mistranslation of the Hebrew word. The translators have probably followed the Septuagint version, where the Greek words *mon kerós* were employed. The original writers may have meant a species of buffalo, as: "He hath as it were the strength of an unicorn."[1] "Will the unicorn be willing to serve thee, or abide by thy crib? Canst thou bind the unicorn with his band in the furrow? or will he harrow the valleys after thee? Wilt thou trust him, because his strength is great?"[2] Such attributes were common to the cattle which could be tamed and used domestically. Primerose (1651) says: "The Jews do confesse that they do not understand many of the names of Birds whereof Moses speaks in Leviticus." Ctesias, the Greek historian, is the earliest writer who gives a description of the unicorn (400 B.C.). He says it was about the size of a horse, with a white body, a red head, blue eyes, with a horn a cubit (20 inches) long on its forehead. Towards the base the horn was white, black in the middle part and red towards the extremity. The animal was very swift and strong, and though not fierce by nature, it fought desperately when attacked, using horn, feet and teeth, so that it was not possible to take it alive. Drinking cups made from the horn preserved the drinkers from spasms, epilepsy and poisoning.

Aristotle describes it as the Indian ass (342 B.C.); while Pliny (100 A.D.) says that it has the head of a stag, the feet of an elephant, the tail of a boar and the body of a horse, while its single horn is black and two cubits in length. Without doubt Pliny was describing the Indian rhinoceros, while other observers may have been deceived by the appearance of the two almost straight horns of a certain antelope (oxynx) which in profile appear as a single horn.

According to certain legends of the Middle Ages, the unicorn could only be caught by placing a virgin near his haunts. By his keen scent he soon finds out the maid, and running to her he lays his head on her lap, and sleeps beside her:

> For there is in their nature, a certaine savor, wherewithall the unicornes are allured and delighted; for which occasion the Indian and Ethiopian hunters use this stratagem to take

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[1] Numbers XXIII, 22.

[2] Job XXIX, 10–12.

> the beast. They take a goodly, strong and beautifull young man, whom they dresse in the Apparell of a woman, besetting him with divers or odoriferous flowers and spices. The man so adorned they set in the Mountaines or Woods, where the Unicorne hunteth, so as the wind may carrie the savor of the beast. The Unicorne deceaved with the outward shape of a woman, and sweete smells, cometh to the young man without feare, and so suffereth his head to bee covered and wrapped within his large sleeves, never stirring, but lying still and asleep. Then the hunters come upon him, and, by force, cut off his horne, and send him away alive.

There was also a belief that the unicorn could detect poison in a liquid by dipping his horn into it: "insomuch as the general Conceit is, that the wild Beasts of the Wilderness use not to drink of the Pools, for fear of the venemous Serpents there breeding, before the Unicorn hath stirred it with his Horn."

The over-literary naturalist, Gesner, says that the unicorn and lion are always like the cat and dog, and as soon as a lion sees his enemy he betakes him to a tree. The unicorn in his blind fury, running pell mell at his foe, darts his horn fast into the tree, and then the lion falls upon him and devours him.[3] Spenser in his "Faerie Queene" describes this occurrence:

> He slips aside; the whiles that furious beast
> His precious horne, sought of his Enimyes,
> Strikes in the stroke, ne thence can be released,
> But to the victor yields a bounteous feast.

John Guillim, the famous herald who wrote "A Display of Heraldrie," (1610) says:

> Some hath made Doubt whether there be any such Beast as this, or no. But the great esteem of his Horn (in many places to be seen) may take away that needless scruple. . . . His Vertue is no less famous than his strength, in that his Horn is supposed to be the most powerful Antidote against Poison. . . . It seemeth, by a Question moved by Farnesius, That the Unicorn is never taken alive; and the Reason being demanded, it is answered "That the greatness of his Mind is such, that he chuseth rather to die than to be taken alive; Wherein (saith he) the Unicorn and the valient minded Souldier are alike. Which both contemn Death, and rather than they will be compelled to undergo any base Servitude or Bondage, they will lose their Lives.

In "Timon of Athens," Shakespeare makes Timon say: "Wert thou the unicorn, pride and wrath would confound thee, and make thine own self the conquest of thy fury."[4]

Topsell, in his "Historie of foure-footed Beasts" (1607), devotes much attention to the unicorn. He writes:

> These beasts are very swift, and their legges have no Articles [joints]. They keep for the most part in the desarts, and live solitary in the tops of the Mountaines. There is nothing more horrible than the voice or braying of it, for the voice is strain'd above measure. . . . It fighteth with his owne kind, yea even with the females unto death, except when it birneth in lust for procreation; . . . when once his flesh is tickled with lust, he groweth tame, gregall, and loving, and so continueth till she is filled and great with young, and then returneth to his former hostility.

From about the year 1500 the Scottish royal arms bore two unicorns rampant. At the union of England and Scotland in 1603, James I ordained that in place of the red dragon of Wales which had been introduced into the royal arms by Henry VII, the figure of a unicorn should be inscribed.

Turning now to medical writers who treat of the unicorn's horn, we find Ambroise Paré publishing in 1582 a "Discours, a sçavoir, de la mumie, des vénins, de la licorne et de la peste." He is sceptical as to the existence of such an animal and remarks that no traveller living at that time had seen one alive. If the Romans had been acquainted with it, he says, they would have engraved it on their coins or arms. Scarcely two writers, he continues, agree in the description of the unicorn. Cardan states that it lives in the deserts of Aethopia, a region squalid and filthy, abounding with toads and such-like venomous creatures. Others say it is a most gentle and amiable creature, but as it cannot feed on the ground because of the length of its horn it lives on the fruit that hangs from trees, sheaves of corn, and pulse. Vartoman denies that unicorns are fierce and says that he has seen two in captivity in Mecha, a city of Arabia Felix. Paré concludes:

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[3] Historia Animalium, 1550.

[4] Act IV, Sc. 3.

> I therefore think that this name unicorn is not the proper name of any beast in the world, and that it is an animal feigned by painters and writers to delight their beholders or readers. As regards the horn, Andrew Thevet thinks that they are the bones of elephants turned and fashioned like unicorn's horne, in the same way as crafty and cunning merchants soften the teeth of the fish called *Robard* (which lives in the Red and Aethopian sea) and draw them to what length they like. Being so fashioned they sell them as the horns of unicorns. If one grants that the unicorn exists, is its horn efficacious against poisons? I have often made trial therof, yet could I never find any good success in the use thereof. A great number of physicians of reputation have long since bid it adieu, and have thus detracted from it's supposed divine and admirable virtues.

Rondeletius says that the chief property of unicorn horn is that of drying; as it is very costly, he prescribed it for the rich while he gave ivory to the poor. Shavings or scrapings of unicorn horn were sold for their weight in gold and were employed against poisons and worms.

Paré ends by saying that he has no belief in the curative property of unicorn's horn "and if any do not approve of this, he shall do me a favour, if, for the public good, he shall freely oppose my opinion, while in the meantime take this in good part which I have done." As may readily be imagined, such an opinion was a medical heresy, and almost the whole of the medical faculty in Paris rose against him. Later, Paré had to publish a defense for his belief.

In 1651 Dr. James Primerose published his "Popular Errours," and in this he has a long account of the unicorn's horn:

> It is not yet manifest what this Unicorne is properly, seeing hitherto it could not bee certainly found out in any Indian voyages. . . . Amatus, the Portugal, says that the horne is of a blackish colour, and that if it bee too old it is of no vertue, and that there are many counterfeit and adulterate ones made up of chaulke and other things after the form of a horne; and that others doe sell the bone of a whale for it; yea and I have heard that seahorse teeth, and elephants teeth have been taken for it. . . . The hornes of the Unicornes which are brought unto us are very long and taken from that creature which the Scripture saith is very nimble. . . . I doe not say that the Unicorne is a fained creature, but it is very rare and not certainly known. Further Caesar in his sixth book makes mention of an oxe which hath but one horne. The water also hath its Unicorne monsters, which perhaps live both in the water and on the land, as Garcias ab Hortó reports of a monster about the Cape of Good Hope which has but one horne in the forehead, wherewith he boldly fights against the elephant. . . . Besides this Danial Sennertus mentions a certain horne which is found in Thuringia and other places of Germanie and digged out of the earth. It is taken for the Unicorne's horne to which they ascribe a great vertue against the epilepsie and malignant diseases. There are therefore divers sorts of Unicornes and yet they have not all vertue against the poyson. Aelian who describes the Unicorne does not attribute any Antidotary facultie thereunto, but onely to the Indian asse; for he writes that the wealthier sort among the Indians are wont to drinke out of these hornes, and that whosoever drinketh out of these is healed of incurable diseases, nor is hee taken with convulsions nor the Falling Sicknesse nor hurt with Poyson. Moreover if he drinks any deadly thing, he vomits it up and returns to his health againe. But the horne of the Indian Asse is very rare, the upper part of it is reddish, the lower white and the middle black, but the Unicorn's horne is all black. Ambrosius Pareus and other most famous physicians have found no effect at all of this horne, and he doeth not approve of that custome of touching the King's meat with the Unicornes horne, which custome I hear he hath abolished who is the chiefe physician-in-Ordinary to the King of France. Garcias reports of this monster that lives both in the sea and on the land, which resembles a horse in shape, that the horne thereof is very much commended for a counterpoyson.

All that have written of them doe prefer those that bee digged out of the earth, for they have an antidotary and preservative facultie and do mightily provoke sweat. The vertue of those medicaments can be found out no other way but by experience onely, it will bee easie for anyone that hath a piece of such bones to give some poyson to a dog or chicken and if it be preserved by taking some of the powder thereof, he may keepe it as an excellent antidote. If we allow of Harts horne, why shall not other hornes have the same vertue. Yea there are some that will have a certain wholesome qualitie to bee in all hornes even of oxen, and therefore the Ancients did drink out of hornes.

Wherefore I would not curiously enquire, whether it be a Unicornes horne, or some other creatures so it be good and efficacious. Cardanus saith that elephants teeth may be made so pliable by art that they can be made streight like hornes and so set out for the Unicornes horne. We must not give credit to those that say that if poyson or some venomous creature be neare unto Unicornes horne, it sweats, as if it did suffer with the poyson, and also they bid make a circle of the powder of it unto the middle of which or into an hollow horn they put a spider which if she pass over, they will have it to bee a counterfeit horn, but if she burst and die it is naturall, all which are false.

I fear greatly that much more than this was false, that indeed the belief in the virtues of the unicorn's horn was altogether false.

THE USE OF CORAL

From the earliest times all manner of precious stones have been employed as medicines. It is not surprising, therefore, to find that such a substance as coral was employed in the hope of curing diseases. In former times coral was difficult to obtain and cost much money. It therefore ranked amongst precious stones and was employed like them to cure the affections of the wealthy.

In the large group of the Coelenterates, the community-loving madrepores are those which secrete the largest supporting skeleton. This consists almost entirely of lime, and the coral may be of almost any color: usually white, we yet find blue, red, yellow, green or brown varieties. Any virtue which coral may have must be in the lime present in so large an amount, but whether the administration of lime, as such, would have any therapeutic value is open to grave doubt.

White coral is mainly obtained from the Red Sea, Indian Ocean or from the East Indies; while the true red coral (*corallium*) occurs in the banks off Algeria, Tunis, Sicily, Sardinia and Naples.

Most of the old writers of medicine extol the virtues of coral, classing it very often along with pearls and diamonds, but there are few who devote special attention to it. The following extracts from a work specially written to advocate the more extended use of coral in medicine may not be uninteresting:

THE ADMIRABLE VIRTUES AND WONDERFUL EFFECTS OF THE TRUE AND GENUINE TINCTURE OF CORAL IN PHYSICK

Founded upon Reason, established by Experience and confirmed by authentical authors in all ages never found out plainly till now.
By Theophilus Garencières, Doctor in Physick, Colleg. London.
London. Printed by W. R. for Samuel Sprint at the sign of the Bell in Little Britain 1676.

It is dedicated to the Hon. Sir Walter Long, Bart., and the treatise is prefaced by a dedicatory poem to the author by Petrus Cottereau. The first chapter treats of coral and the divers kinds thereof. The author says that it is a shrub which grows at the bottom of the sea and that it becomes stony when exposed to the air. This is really a translation from Ovid's "Metamorphosis," 4: "Sic Coralium, quo primum contigit auras Tempore, durescit; mollis fuit herba sub undis."

There is a red, black, green, yellowish ash-colored coral or a mixture of these; the red, which is called the male, is preferred above the others. Anselmus, physician to the Emperor Rodolphus, describes a coral of several colors upon the same body; this body was coral and stony, whereas the branches were ligneous or woody. This is not improbable, for he says:

> I have seen in the north of Ireland a Lake called Lake Neaugh wherein if a piece of wood be planted, that part which is in the ground is turned into iron, that which is in the water, into stone and that which remains above the water, remains wood. We may guess that coral under water is not altogether soft and flexible, and this happens to many stones also which lie newly digged out of the ground, are as soft as cheese but grow hard when exposed to air. Now whether Coral groweth out of the Petrifying Juyce or is at last altered by this Juyce is a question. For my part I believe that it does not petrifie until it dieth. Nature maketh use sometimes of the Petrifying piece for the producing of the Plant, for it hath been observed that Coral hath grown out of the pieces and fragments of Earthen pots. Now the reason why coral should petrifie and other plants not, is because of its peculiar disposition. No reason can be given for its colour, no more than for that of a Rose. God hath been pleased to adorn things with such colours. Many plants that I have seen that were not wholly petrified were of a Dusky, green or such colour as we see in Trees, and those only began to be red that had nothing woody in them, as we see in Apples and Pears; the Red colour is a sign of their ripeness. The best coral is found on coasts of Tunis and Tripoli. Theophrastus includes coral among precious stones. The author narrates the story of a captain of a vessel fishing for coral who affirmed from his own experience that coral while in the sea was as hard as when exposed to the air, and that when coral is broken, a milky fluid runs from it and that this produces coral on any substance on which it may fall, adducing the circumstance that he had seen the skull of a man in the cabinet of the great Duke of Pisa upon which was grown in the sea a great branch of coral. Though coral may be hard at the bottom of the sea, it is nothing so hard as when it hath been exposed a while to the air. According to Dioscorides and Matheolus, coral is moderately astringent and cooling, but his specifick qualities are so many and wonderful that I should show myself too prolix and tedious if I would treat of them one by one.

He then goes on to quote from Anselmus de Booth, "De Gemmis et Lapidibus":

> Who testified that by taking six drops of the tincture of coral he was cured of a pestilential fever which had almost killed him, and this it did by a certain Celestial power that eradicateth all diseases out of the internal parts. It cureth the Falling sickness in a few weeks and is commended above all against the immoderate Fluxes of Women. In a word, Coral strengthens the Heart and therefore is a soveraign Remedy against the Plague and all venemous contagious and malignant Diseases. *Arnaldus Villanovus* relateth, that if ten grains of the Tincture of Coral be given to a child newly born mixed with some of the mother's milk, before the child hath taken any other Meal or Drink, the said child shall never be troubled with the Falling sickness.
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> *Crollius* the Prince of Chymists says that the secrets that are in Coral are altogether admirable and its Faculties beyond expression. [He then gives a long list of diseases which it cures.]
>
> Our worthy Countreyman, Roger Bacon, in his learned Treatise *De Retardanda Senectute* commendeth Coral as of a wonderful virtue against the infirmities of old age.
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> I could bring the authority of all the best Physicians in all ages that have made mention of coral. Many grave and authentical authors did not stick to say that Coral was an Amulet or Charm against Fearfulness, Bewitchings, Sorceries, Poysons, Falling Sickness, Assaults of the Devil, Lightnings, Sea-storms and other dangers whatsoever. Anciently, it was among the Indians almost of an equal value with Pearls of the same bigness. It is also certain that Red Coral, if worn by a Man, hath and preserveth its colour better than that which is worn by a Woman; perhaps because the heat of a man is greater than that of a Woman; and the vapours that exhale out of his Body are purer. Moreover it is an undoubted truth that Red Coral will grow pale, blewish, and maculated with several spots, when it is worn by one that is nigh death or dangerously sick and will foretel diseases by the changing of its colour. This I found by a sad experience of my own: for having a girl about twelve moneths old that wore a Bracelet of Coral, she fell into a pestilential Feaver; so that when I spied the Coral quite altered, I began presently to despair of her recovery,

> which I would not have done, if I had known then the Tincture of Coral, as I do now. She lived but two days in that case. After her death I would have taken the Bracelet from her, and tried whether I could have brought it to its former colour again; but the Mother would never suffer it, and would have it buried with her, and so deprived me of so just a curiosity. What affliction it is to Parents to see their young children sick, whereas a spoonful of this tincture may preserve them alive to the honor and glory of God and the satisfaction and joy of their Parents and Relations.
>
> The Tincture or Essence of Coral is the most secret and internal substance that Nature had enclosed and concealed in the Intrals of it, to preserve it from all external injuries and accidents.

He explains the method of making the Tincture of Coral and says:

> [What] remaineth in the Viol is not to be thrown away, for out of it by chymical art may be extracted the Salt of Coral which in all respects emulateth and cometh very near the Tincture except in the curing of malignant and pestilential diseases.
>
> I do undertake (with the Grace of God) to cure the fiercest Plague with Venice Treacle and my Tincture of Coral.
>
> Seeing that there is no member in an Humane body but hath its proper and peculiar infirmities, the most High provided Remedies against them all; seeing also that there be members hidden and concealed in the most retired places of the Body, where there was no access for Herbs and Plants to come to, He hath given them like as it were Beams of Light, spreading themselves round like those of the Sun which passing through all the Body, do by their Actinobolism or Irradiation penetrate to that member which is correspondent to them and hath need of their Faculties and Virtues. Thus all cordials by their actinobolism do not meddle with the liver, Brains or spleen, but with the Heart. The Actinobolism of the Cathartics and Diaphoreticks gather together into the Intrals all the choler lurking in the Body and from thence carry it away as a superfluous and noxious thing. The biting of a Mad-Dog giveth to a man the Dogs manners; and that of a Mad-Cat imparteth the Cats manners. Skenkius relateth of a Maid that had eaten of a Cats Brains and did perfectly imitate a Cats manners, expressing its voice and hunting after Mice with her crooked fingers and Nails.
>
> In Malignant and Pestilential Disease, Bleeding and Purgation are not to be admitted unless there be an extraordinary fulness of Humours. As little significant is the new way they go about by Blistering. This practice seemeth only to be invented to beget apothecaries practise and Physicians something to say when they are at their wits end. But Cordials go directly to the Heart, chear it up and fight against the Malignity.

He then goes over the method of taking the Tincture of Coral as "set down in our Book of the last great Plague 1665. The book however is hard to be had, there having been three impressions dispersed in six weeks time and none to be had at present." In brief, a dose of the Tincture is to be given, then the patient is to be put in a hot moist pack for three or four hours. This course of sweating twice a day must be continued for four or five days together and in this space of time all the Malignity and Pestilential poison will expire. The dose is to be continued four times each day. He then demonstrates the "dangerous and poysonous quality and Use of Blistering Playsters which contain Cantharides." He quotes many authorities to show the poisonous properties of this blistering agent. He applied a Vesicatory of Cantharides to the neck of his own daughter, aged fourteen, to cure her inflamed eyes. Within three or four hours she fell "stark lame of her right hip, and this continued for three or four weeks. It is thus apparent what a dangerous thing Cantharides is." He ends by giving a long list of all the diseases which Tincture of Coral will cure and concludes by thinking:

> This list will be sufficient for any reasonable and ingenuous person. Those that will know more may advise with the author, advising them seriously that if they receive no benefit by this Remedy in those Diseases they can hardly expect it in any other. The Author also having a peculiar Talent to judge of diseases and the Remedies thereof, by the Inspection of urines, desireth those that will save charges or lives afar off, to

send their water; by the examination of which, they shall receive all reasonable satisfaction and for these purposes and others, he shall give his constant attendance at his own House from eight of the clock in the morning, till eleven; and from three in the afternoon, till five. The rest of the time it will be known where he is and when he will be at home again.

As for the said Tincture of Coral with the vehicles proper for it, they are only to be had and ministered by him, to prevent all supposition, falsification or mistakes, the world at present being so full of Envy, Backbiting and Deceitfulness that he dares trust nobody with it, but is resolved as he is the sole Author of it, so to have all the praises of it, and bear all the blame alone, if any be.

Garencières

From my House in Clarkenwel close
the second on the left hand

The Use of Stones

In all times and amongst all peoples certain stones have had a magical power attributed to them. Hung round the neck they acted as charms to ward off evil influences, to protect the wearer against witchcraft, to preserve the health, to prevent infection, to relieve pain or to cure disease.

In the very last letter which our unfortunate Queen Mary of Scotland wrote from Fotheringay on the day of her execution, February 8, 1587, to her brother-in-law, Henry III, King of France, she sends him two stones, rare for the health, and wishes him perfect health, together with a happy and long life. ("I'ay pris la hardiesse de vous envoier deulx pierres rares pour la santé, vous la desirant parfaicte, avec heureuse et longue vie.")

To go back to the early dawn of human history, in many of the caves once inhabited by Magdalenian men, curious spotted, striped or painted stones are found. It is of course not known to what use these were put, unless, as is most probable, some magical property was attributed to them. In the Grottes de Grimaldi in Italy, a small smooth stone had been placed in the mouth of each of the bodies found there. These skeletons belonged to the type of the negroid race of the Cromagnon period; and in the graves of a neolithic cemetery found at Monte Carlo, these stones, placed in the mouth, were small and round and either white or black in color.

Whether these stones had been placed in the mouth of the deceased for a magical purpose, we know not. The practice might adumbrate some such superstitious belief as that of the Romans and Greeks during their early period. These classic peoples placed a small coin (an obolus of the value of three halfpence) in the mouth of the dead body. This was to pay the fare of Charon, who ferried them across the river Styx to the Elysian fields. Prehistoric man may perhaps have had some such object in placing the stone in the mouth of his dead relation or slave.

In Australia and Melanesia, the witch doctor told the patient that his illness was due to a stone which was situated at the sore part. He pretended to suck it out, and exhibited to the afflicted one a stone which he had secreted in his mouth as the one which had been the source of the illness.

That our predecessors in the practice of medicine had a complete confidence in the value of stones of various kinds as absolutely reliable therapeutic agents is well known. We have only to glance at the prescriptions of many of the older writers to see that their materia medica included practically all the known precious stones. These were believed to have been dewdrops which had been condensed and hardened by the sun's rays, and were consequently endowed with special properties in the cure of disease. Lapis lazuli in doses of 30 to 60 grains of the powder produced emesis and evacuation and was good in epilepsy and fever. Margarites or pearls were employed, but seldom alone. The coarse, rough or very small ones were used. "A confection of Perles of Doctor Nicholas called *Diamargaritum calidum* was made up of twenty-eight ingredients." Amongst these were "little balles of roses, little balles of violets, one drachm of perles, the bone of the heart of the red deere. It comforteth the lively partes of those whiche be pensiful and sad, sighing or be in a consumption."

To another Confection of Perles, we find ivory, gold, sapphire, jacinth and emerald are added. Jasper was the *lapis sanguinaria* and was employed to staunch the flow of blood from wounds. Michael Psellus (1020–1105) describes the healing property of precious stones. He recommends amethyst in the treatment of mania induced by over-indulgence in alcohol; amber for fevers and diseases of the genitourinary system; jasper for epilepsy and beryl for jaundice.

At a much later date we find the *Electuarium de Gemmis* prescribed by many writers. This consisted of a mixture of pearls, coral, emerald, jacinth, cornelian and many other ingredients. It was reputed to cure diseases of the brain, heart, stomach and matrix. Nicholas Praepositus (1140) says that kings and noblemen have used it for their great comfort: "It causeth them to be bolde and spyrted, the body to smell wel and engendreth good colour."

Restricting our observations however to single stones, we find that our ancestors made use of a stone which was found in the nest of the eagle. It was called by the Greeks αετιτις or the eagle-stone, and they believed that the eagle could not lay her eggs without this stone being present in the nest. This stone was really only a lump of argillaceous oxide of iron, often hollow in the center. Sir Thomas Browne in his "Vulgar Errors" (II, 5) says: "Whether the aetitus or eagle stone hath that eminent property to promote delivery or restrain abortion, respectively applied to lower or upward parts of the body, we shall not discourage common practice by our question." This stone was used for a variety of purposes but perhaps its most successful application was when it was bound to the thigh of a parturient woman in order to facilitate the birth. It might indeed accomplish this, the mere idea of its efficacy lending greater power to the patient's efforts. To ward off the attacks of epilepsy, the stone was also hung around the neck.

The bezoar stone has had from the earliest times an immense reputation. Large sums of money were paid for what were considered veritable stones, as the potency of these was implicitly believed in. Really they were any calculi found in the bladder or intestines of a herbivorous animal, *e.g.* wild goat, ox, antelope, llama. The "Oriental bezoar stone" often consisted of a ball of felted hair or vegetable fiber, consolidated to a solid mass. This *lapis occidentalis* was obtained from the stag or wild goat of Persia; the *lapis simiae* came from a Brazilian monkey and cost much money as it had great potency; the *lapis porcinus* was very bitter, being found in the gall-bladder. Primerose in 1651 says that this stone was supposed to have:

> . . . an admirable vertue of corroborating the heart and of being a very strong cordiall to which people flew as to some sacred anchor. Some would have it called Belzaar, which in the Moore's language signifies the *Lord of Poyson*, or as we call *Antidote*, as did Averrhoes and Avicenna. It is a stone which comes out of India. The Arabians do highly commend it against poysons, the plague, jaundice and all obstructions of the body and bowels. Avenzoar says that he saved one that had taken deadly poyson with three graines of Bezaar, but if we read his own book, we find that it is not our stone, but the teare of an Hart of which he talkes so much. The Hart, as Plinie also testifies, by the breath of his nostrils drawes serpents out of their holes and eats them, immediately he is taken with a grievous thirst, for the quenching whereof he runs to some standing poole, in which he plunges himself up to the neck, but through nature's instinct, hee drinks not, for if he should, he would fall down dead presently. Then a certain humour distils to his eyes, which by degrees thickens, unites and compacts together, and growes to the bignesse of an acorne, which afterwards being come out of the water, the Hart shakes off, and is fought for by men which some call the Bezaar stone. But this stone of ours is not the teare of an Hart which is too rare if even there was such a stone, but this stone which wee use is very

common. It is of different colours, but the yellow is the best. Rhazes writes that it is a soft stone, of a yellow colour without any tast, and he used it with success against wolvesbane. Garcias, Physician to the Viceroy of India will have it to be dark green colour and saith that all must be brought to the King of the country and that they cannot without much difficulty bee had from thence, and now seeing they are so common, much doubt is to be made touching their goodnesse.

One sort of this stone is brought out of the East from Persia which is found in a certain kind of goat; the other brought from the West, from America, which is found in divers creatures. Bezaar is not to be relied upon, for some authors write that they provoke sweat and sometimes vomit, which thing if a man make triall of ours, he shall not finde to be alwayes true. I have very often given it to my patients, but I never perceived any of the effects. Vallesius, a most learned man, chief Physician to Philip, the second, King of Spaine, thinks there is not a true Bezaar in Spaine, and if so it is lesse likely that there should bee a true one sold among us, and if true then its very probable ours are all sophisticate. He thinks there would not be sufficient animals to provide all the stones sold in this and in other countries. There are no sure and infallible tokens whereby the true may be distinguished from the false. Stones are found very like the Bezaar in divers creatures, as horses or swine, which are of no vertue at all. Some would have it that the stone is temperate, others cold, but none hot. It is therefore more probable that it works by an occult property, to wit, in corroborating the heart and fortifying it against the malignity of poyson, and unless this be present it doth no good.

The dose may be three graines as given by Avenzoar, but Garcias gave thirty. Now because the right Bezaar is seldome found, and that which wee have is sold at too deare a rate, my counsell is that it be prescribed only for rich men and that a large dose bee given."

One writer, however, wisely asks that if the stone cut out of the bladder of a goat be used, would it not be wiser to use that cut out of the bladder of a man as being a more noble creature, fed with meat and his spirits warmed with wine, than that of a goat starving on the mountains.

Another writer says that he has no faith in its virtues, but that his rich patients would not be contented without it.

The above idea seems to have been actually put into practice, because we find it stated that "a man's stone drunk fasting is most powerful of any to break the stone and expel it with the urine." It had also the power of acting as a sudorific or as a diuretic. ("The Poor Man's Physician," 1716.)

Concretions found in the alimentary tracts of birds and other animals also found a place in ancient materia medica. A work published in 1582 gives a prescription for breaking the stone in the bladder:

> You must give the poudered stone which is founde in the bellies of ryng doves. These birdes are so subject to this stone, that if kept in cages they soon dye, because their meate can not passe through them and that is because the poore birde can not goe and helpe hym selfe with that medicine which Nature hath taught hym. For those al likeilie flie unto the sea side and there finde a certaine kinde of small stone very harde, the whiche stone has vertue to dissolve the stone in the belie of the birde.
>
> Truely the vertues of stones are very greate unto those that knowe them. I saw once in Rome two stones of inestimable vertue. One beyng laied upon the flesh of a man or woman, it causeth them to pisse out greate aboundance so that it were to bee wondered at. The other was of suche vertue that beyng laied upon a wounde, presently the bloud stenched so that there fell not doune one droppe. [J.Hester.]

In the Highlands of Scotland belief in the miraculous property of certain stones to cure disease was common until a very recent period, and indeed, it very likely still persists in certain localities. One of these magic cure stones was called *Clach Leighis* or the "little subduer of pain," which property it exerted when placed on the painful part. When not in use, it was kept rolled up in a rich piece of cloth and placed in the best chest in the house. In many cases the stone was immersed in water for some time, and the patient then drank the water which had thus acquired the magical property of the stone.

THE POORE'S PLAGUE AND MR. PEPYS

By G. R. OWEN, M.D.

LOS ANGELES, CALIFORNIA

AT the beginning of London's Great Plague of 1665, Samuel Pepys was thirty-three years of age. With four exceptions bubonic plague had been known in London every year since 1603. The "Long Visitation" of 1640–1647 occurred during his adolescence, that period of interrogation, when doubtless, in answer to his countless questions, he was regaled by the oldsters of his family with gruesome tales of the very considerable epidemic of 1625. He, having been about eighteen at the end of the "Long Visitation" and of an extremely acquisitive and curious turn of mind, had in all probability made some personal contacts with the sick and recovered. His contemporary, John Evelyn, at the age of six, "well remembers the strict watches and examinations upon the ways." That a wholesome fear had been implanted in his youthful mind we are certain, for in the first year of the Diary, six years before the great epidemic, he expressed a fear that a certain case of some febrile disturbance might have been that dread disease.

Pepys was not a man of particularly tender susceptibilities, judged from our day and age. He was well educated, having taken his degree at Cambridge. His public life began at the time of the Restoration when Cromwellian heads on pike-staffs and drawn-and-quartered Roundheads were common embellishments of the city walls. He perched with some discomfort and difficulty upon the axle of a cart to witness the execution of a prominent regicide, who "was presently cut down and his head and heart shown to the people, *at which there was great shouts of joy*." (June 6, 1661.) He had been "cut of the stone" without benefit of anesthesia. As a guest of Chyrurgeon Pierce he had witnessed a thorough dissection of the genitourinary system. He was intensely interested in and recorded an early breast amputation. He was an intelligent observer of the first successful blood transfusion from one dog to another. The clinical progress of Prince Rupert's syphilitic cranium evoked his deepest curiosity. All this to indicate that his plague reactions were not those of a novitiate or a recluse.

Evelyn, an eyewitness, has given us something of the epidemic. John Allin's letters are illuminating in spots, though his principal concern seems to have been to perfect his own panacea for the plague. Defoe's "Journal" was composed by a sexagenarian writer of fiction, who cleverly built the vague and fragmentary recollections of his fourth to tenth years into a semblance of authenticity. Bell states that documents and records absolutely essential to an adequate history were not available in 1720, at which time it was written. Hodges' "Loimologia" is the best medical record. He was the medical hero of the epidemic, and the city physician of London, and as such his testimony is invaluable. He was obsessed by the plague, and saturated each day by huge libations of sack, his favorite prophylactic. He was never, and never could have been, a detached observer. Pepys' observations are frequent, often coldly analytical, and seldom emotional. Bell, though he quotes him copiously, does not like him, probably because he disappoints him. Pepys' dalliances and amours, his constant references to everything from "sealing-wax to kings," annoy Bell, whose heart and soul are concerned with the plague, and things pertinent to the plague, in his transcendent history of that great epidemic. We may criticize Pepys for "fiddling" while his fellows were consumed, but we can never accuse him of having overdrawn his subject. So let us view with him "Our Lady London" of 1665. Not the intriguing, romantic matron of A. Edward Newton's fascinating vision, but a pock-marked, bloated, slatternly old harriden diseased to her very marrow.

Despite our admiration and affectionate regard for Pepys, the diarist, the cheerful gossip and sybarite, the critical observer with his acutely analytical interest in all of the varied activities of his day, we cling automatically to his coat tails, as with emotions at their very saturation peak, we follow him about among the hideous, stalking specters of that stupendous tragedy. For the time being he is subordinated to the major portion of our theme. Even as we lose sight of Faust as we watch him contemplate the "Brocken," the "Brocken" steals the scene:

"I was much troubled today to see a dead man floating upon the waters, and had done (they say) these four days, and nobody takes him up to bury him, which is very barbarous." (April 6, 1662.) This entry is a pregnant introduction to a consideration of the sanitary conscience of the ancient city. Again, our guide records his fears and difficulties in attempting to return, by coach, with his family and friends, to his home after nightfall. A hazardous task through those streets which Knight describes as "very foul, full of pits and sloughs, very perilous and noxious." Sanitation laws there were, inadequate, always difficult and often impossible of enforcement. Householders were responsible for the sweeping of the public streets to the extent of their own frontage, the piles of refuse thus accumulated to be taken up by the "rakers" and deposited on the various and putrid laystalls, huge piles of rotting refuse. Long Ditch, the Fleet, and the numerous streams draining the city and town were but open sewers over which "houses-of-office" were erected, and into which honest citizens leaning from their projecting casements naïvely deposited the contents of their chamber-pots. These were the streams that the plague had always closely followed. Spring water was delivered by conduits to parts of the city, but wells were common and often drained the churchyards but a stone's throw distant. Certain districts frankly lifted their water from the turbid Thames. Projecting upper stories nearly met over the narrow, poorly paved and seldom sun-bathed streets. Especially so in the out-parishes and liberties which so closely hugged the old city wall, these houses were built almost back to back, being separated only by the labyrinthine alleys which debouched in mysteriously devious ways into the widely separated country roads that lead into the business streets of the city proper. There were no business streets without the wall. All of these unsanitary conditions were among those classed as "annoyances conducive to epidemics" by the College of Physicians. The College had no authority. They were invited to formulate certain rules and restrictions, which they did promptly and well. Each parish, every liberty, the city, the town, the Archbishop of Canterbury and the Crown all had certain authorities and prerogatives Each being resentful of the encroachment of authority of the other, coherent action became impossible except in times of extreme stress, when, as in great epidemics, the magistrates were granted due and sufficient power to attain a modicum of centralization.

From November 26, 1663, to August 4, 1664, we find frequent references in the Diary to the plague among the Dutch: "The plague it seems grows more and more at Amsterdam: and we are going upon making of all ships coming from there or any other infected places, to perform their Quarantine (for thirty days)-a thing never done by us before." (November 26, 1663.) This threat became a law in June, 1664, and was of necessity rigidly enforced after the declaration of war against the Dutch in February, 1665, when the latter nation blockaded England against all shipping. There was, and has been since, much ado as to whether or not the plague of 1665 came to England through the medium of Dutch or Turkish goods. It seems reasonable to assume that the Great Plague was but a flare-up of the latent, domestic contagium, which as before stated had been absent from the Mortality Bills but four times in sixty-five years.

A strange hiatus now appears in the Diary, for we find no mention of the epidemic from August 21, 1664, to May 24, 1665. Then, as always, plague was fatal to the normal conduct of business. There were but two newspapers in London both under one owner, a creature of the Crown. These bi-weeklies made no mention of the plague until June, 1665, though we may add parenthetically, that they carried an anti-plague remedy advertisement as early as April of that year. One fails to see, however, how this natural avoidance of publicity could have affected the ciphered pages of the Diary, which contained not only treasonable sentiments, but the most secret thoughts of the diarist, both sacred and profane. "This day, much against my will, I did in Drury Lane see 2 or 3 houses marked with a Red Cross upon the doors, and, 'Lord have mercy upon us' writ there; which was a sad sight to me, being the first of the kind that, to my remembrance I ever saw." (July 6, 1665.)

Allin, a much less keen observer, mentions casually having heard of two houses in Drury Lane "shut up for the sickness." This in April, 1665. Surely our diarist, whose somewhat morbid curiosity will be indicated later, had heard of this, but for some inconceivable reason gave space to infinitely less important things. On May 28, he mentions the perturbation of ". . . my poor Lady [the wife of his patron and kinsman, Lord Sandwich] who is afeard of the sickness, and resolved to be gone into the country." This, Bell avers, accounts for the hiatus. "Plague was outside his interests till the movements of the fashionable world attracted his attention." This does not merit our humble approval, for we cannot forget the admirable and highly capable public official in the contemplation of the intensely human gossip and playboy. We know no kinder reason, however, unless it be that he refused to admit, even to his inanimate confidante, the advent of the horror that had haunted his childhood.

The severe winter of 1664–1665 did not prevent an occasional sporadic case. One in December and one in February were in turn recorded, yet many more must have occurred, for the strict observance of Lent was not officially ordered. Notification of plague deaths was not compulsory, nor was there any central authority to notify, yet a knowledge of the impending epidemic must have filtered through to the seats of the mighty. St. Giles, the hotbed of the epidemic, admitted two deaths in April, 1665. Although the papers were silent on the subject until June, we may be sure that it had attained considerable proportion, for in May the King appointed a Privy Council to discuss ways and means of control. This Council ordered among other things the enforcement of the "forty day house quarantine law,"[1] as well as the drastic "inmate eviction law." This latter provided for the eviction of roomers or lodgers that the sadly over-crowded slums might be depopulated. It was impossible of enforcement, for it meant that labor was to be driven away from trade and manufacturing centers, thus imposing an economic crisis second only to the plague itself. The class that herded together in attics and basements and suffered the greatest mortality occupied a paradoxical position. London could live neither with nor without them.

Our chronicler's first reference to the actual epidemic appears on May 24, 1665, and indicates the inevitable reactions to a calamity of this type. "How to keep it away?" The pious: "It is God's will!" The fatalistic followers of the Turk: "What is to be, must be!" And the great army of the practical and the panicky: "What to do?" "Thence to the coffee-house [that sixteenth century prototype of the hot-stove league] . . . and heard of the plague growing upon us in this town; and of the remedies against it, some saying one thing, some another."

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[1] That if any house be Infected, the sick persons be forthwith removed to the Pest-house, Sheds, or Huts for the preservation of the rest of the family; and that such house (though none be dead therein) be shut up for Fourty days, and have a Red Cross and *Lord have mercy upon us,* in Capital Letters affixed on the door, and Warders appointed, as well as to find them necessaries, as to keep them from conversing with the sound."

Remedies

Indeed the question of remedies had been ever, and with reason, a matter of most serious discussion. They commenced with the solemn emanations from the College of Physicians with its official Spiritus antiloimoides, and the adopted Angier's fume. These failing, the distracted populace ran the gamut from precious metals, uncountable pectorals, cordials, pills at 2s. 6d. each, plague waters, dead toads, unicorn's horns, anagrams, epithems, amulets and, in fact, almost anything that a frenzied imagination might conjure. A "true philosophical elixir of gold" sold for £5 per ounce. John Allin, physician and divine, importuned his friends to gather for him "the moss that grows on dead men's skulls and bones," a pharmaceutical legacy from Paracelsus, probably to aid him in compounding his elixir of life. He attributed his own immunity to the following:

> Friends, get a piece of angell gold if you can, of Elizabethan coine (that is ye best), which is phylosophicall gold, and keep it always in your mouth when you walke out or any sick persons come to you.

One Constantine Rhodocanaces, with the publicity gift of a subdivider, advertised the remedy "wherewith Hippocrates the Prince of Physitians, preserved the whole land of Greece." These quack remedies were as efficacious as those of the College. The crime lay in the extortionate prices. Pepys wore a rabbit's foot for colic. His friend, Sir William Batten, convinced him that it was inefficacious because perforce, it lacked the first joint. Tobacco had a tremendous vogue. Pepys on first seeing the Red Cross in Drury Lane wrote: "It put me into an ill-conception of myself and my smell, so I was forced to buy some roll-tobacco laid to smell and to chaw, which took away my apprehension." (June 7, 1665.) Not having been an habitual tobacco user it is possible that his apprehension was removed in the process of emesis. Excavations of old plague burying-grounds disclosed quantities of old clay pipes, evidently used by the buriers for disinfection purposes. One correspondent wrote of having suffered a severe punishment, while a schoolboy at Eton, because he had failed to indulge in his prophylactic matutinal pipe. It was bruited about that venereal disease conferred immunity. "Wicked and impious was the result," Dr. Hodges tersely states. As horrible and deplorable as an analogous belief among Mexican peons today. An inkling of Boghurst's acumen is contained in one sage sentence: "As for some of these they may do a little good, as those which concern care and cleanlyness, and temperance.'

Doctors

> And to my great trouble hear that the plague has come into the city . . . but, where should it begin but in my good friend neighbour's, Dr. Burnett . . . which in both points troubles me mightily. [June 10, 1665.]
>
> I out of doors . . . to shew, forsooth, my new suit . . . and in going I saw poor Dr. Burnett's door shut; but he hath, I hear, gained great goodwill among his neighbours; for he hath discovered it himself first, and caused himself to be shut up of his own accord; which was very handsome. [June 11, 1665.]

To the latter sentiment we of the craft acquiesce. With such complacence are we prone to acclaim ourselves. Let us glean what comfort we may. There were many known medical heroes and some martyrs: without doubt there were many unsung. ". . . And they tell me in Westminster, there is never a physician and but one apothecary left, all being dead." (October 16, 1665.) Dr. George Thomson, with the tremulous assistance of a bondservant, fumes and incantations ascending, for he was a believer in things *extra naturam*, performed the first recorded plague post mortem. His protocol, unfortunately, is in a language and of a knowledge so archaic that it possesses only an historical value. Harvey had discovered and demonstrated the circulation of the blood, yet our pathologist ascribes some "albified coagulation" in the right ventricle of the heart as having come from "a sumption of meer crude milk, which an indiscreet nurse had given this youth not long before he died." He mentions a "black, fuliginous matter" in the other ventricle, "that publike shop and treasury of life" as "fitting only for the infernal stomach of the Dogg Cerberus." Affrighted at the task he had so courageously completed he felt the aura of the feared "sickness," which, fortunately, a good dead toad upon his breast aborted. His "Loimotomia" is a museum piece, the author forgotten. Dr. Hodges has been mentioned. His "Loimologia" also has accumulated the dust of centuries. He died in penury some years after the plague, having degenerated, one infers, into a sort of Falstaffian coma. Fate plays queer pranks.

Sydenham has left us an oft-quoted essay on the plague. A really great clinical frontiersman, yet he was in the van of the fashionable physicians who followed their patients into fairer pastures; he was in the wake of those returning heroes. He had no first-hand knowledge of the disease. "Dr. Goddard did fill us with talke, in defense of his fellow physicians going out of towne in the plague-time; saying that their particular patients were most gone out of towne, and they left at liberty." (January 22, 1666.)

Sydenham's posthumous plague fame has exceeded that of the faithful few who remained to fight, including such illustrious ones as Glisson and Paget. Not so with Boghurst, the humble apothecary, however. His "Loimographia" has been re-edited and presented to the Epidemiological Society. He is reputed to have done forty dressings of the loathsome plague sores each day. He ate and drank with the plague-stricken, calmed the delirious, and closed the eyes of the dead. For some mysterious reason, not ascribable to his electuary at 8d. the ounce, he was anathema to the rat-flea. Like Pepys, he was a player upon the lute, a charm not hitherto mentioned among hundreds. Who knows? The College of Physicians at Amen Corner, doomed for destruction in the Great Fire, was deserted except for a secretarial caretaker. At the peak of the curve in September there was but a small fraction of the number of physicians needed. To the glory of those on duty, be it recorded that they forswore their munificent fee of one shilling for each case reported, and fought to the bitter end. One eminent divine prayed "that neither the physicians of our souls or bodies may hereafter in such great numbers forsake us." Fortunate the physician of whom it was written by a surviving colleague: "He hath his exit with applause, and is wanted by many that better value him now, than when they enjoyed him."

To return to Dr. Burnett. The good will engendered by his rare and unselfish action was quickly nullified when some malcontent, probably a former patient with an unpaid balance, spread the ugly rumor that the servant for whom the house had been sealed, and who subsequently died, "was by him [Dr. B.] killed." The harassed physician exhibited to Pepys a written acknowledgement from the master of the pest-house, "that his servant died of a buboe in his right groine and two spots on his right thigh, which is the plague" (July 22, 1665), and so posted it on the 'change in self-vindication. According to a letter from J. Tillison to Dean Sancroft, Dr. Burnett and two or three of his colleagues were infected during the post mortem on a plague victim and died within a few hours. Dr. Allin writing independently verifies this in a somewhat contemptuous manner, he being a Galenist and they but poor benighted Paracelsists. The "Chiros" were not yet! "This day I am told that Dr. Burnett, my physician, is dead of the plague . . . poor unfortunate man." (August 25, 1665.) Laconic comment upon the death of one of his oldest and best friends. Already his emotional edge was becoming dulled.

BILLS OF MORTALITY

On June 5 *The Intelligencer* reported forty-three deaths from the plague. It seems proper at this time to give some little consideration to the "Bills of Mortality," mention of which occurs frequently in the Diary. The "Bill" is the progenitor of the modern "Vital Statistics" and was used originally to indicate the presence or absence of the plague. It was compiled from the records of the various parishes, and was published weekly, and vended for the sum of one penny. It was based almost entirely upon the reports of "the searchers of the dead," illiterate, alcoholic, penniless old women likely to become burdens upon their respective parishes, and for that economic reason appointed. They were the pariahs of the parishes, herded together away from their relatives, and obliged to carry a distinguishing mark when abroad, that they might be known and avoided. When death visited, the parish officials were notified. Thereupon the sexton arranged for the preparation of the grave in consecrated ground, and the parish-bell tolled forth its doleful message, that calamitous, portentious knell that was to sound its awesome clang from dawn to dark until all London shuddered and could stand no more! Then there shuffled forth the "searchers," gruesome, ghoulish traffickers to invade the very houses of the sick to enquire if any were dead. Small wonder that a fee of a half-crown and an extra pint or two of ale might induce these ancient beldames to report a death as "feaver" or "Tissick" that a distracted householder might evade the dreaded Red Cross. Forty days! Doors and windows tightly closed and keyholes plugged to shut out the miasmatic air, which was reputed to make the very birds drop from the trees. At the mercy of "watchers" for their food and drink. The living, the sick, the dead, and the dying herded together like very felons. A dear one gone, perhaps the mother. The day of freedom approaches, when the father, a babe, or a servant falls into delirium. Or the grandmother sees upon her withered breast the dread "tokens" that spell her doom. Another forty days! The bells! Always the bells, from far and near in that City of the Spires. Nights of horror, with the creaking and rattling of the loaded dead-carts, the delirious cries of the suffering, and that awful cry of doom, "Bring out your dead!" What wonder that the honest householder shirked, lied, perjured and bribed, left his dwelling to a servant or two, and fled into the out-country to disseminate the horror that was his.

Let us look at a facsimile of the Bill for the year ending in December, 1665, that we may realize in what a shoddy fabric the estimated plague mortality was woven, remembering always that the diagnoses were made only in rare cases by the physicians or apothecaries. Almost invariably the "cause" was designated, usually without clinical history, and largely upon postmortem "signs," by the "searchers" or their equally ignorant prototypes, the nurses. We except, of course, that pathetically small group of devoted nurses, the nuns. The plague figures for the year were estimated at 68,596, which deducted from the estimated total of "deaths from all causes" leaves 28,710, divided into such vague groupings as "Spotted Fever and Purples, 1929 [Plague was known as the spotted death]; Griping in the Guts, 1288; Consumption and Tissick, 4808; Ague and Feaver, 5257; Teeth and Worms, 2614 [plague infection in infants was uniformly fatal]; Dropsy and Timpanie, 1478 [Dropsy connotes chronicity, ordinarily. We do not expect people in the same house and in the full exercise of their powers to be stricken with dropsy and die within forty-eight hours]; Rising of the Lights," 397. The "executed" and the "murthered and shot" form a small group which we can accept without question.

Parish pride was the cause of obvious falsifications:

> Up betimes and . . . met with Hadley, our clerk [the parish clerk], who upon my asking him how the plague goes, he told me it encreases much, and much in our parish; for, says he, there died 9 this week, though I have returned but six, which is a very ill practice and makes me think it is so in other places. [August 30, 1665.]

And again:

> 6102 of the plague. But it is feared that the true number died this week is nearer 10,000 partly from the poor that cannot be taken notice of, through the greatness of the number, and partly from the Quakers and others that will not have any bell rung for them. [August 31, 1665.]

It is quite true that the Jews, Anabaptists and Quakers refused to report to the austere and unsympathetic Church of England, consequently their dead were not included. Hundreds of the delirious rushed forth from their dwellings to wander about the streets until death overtook them, and laid them with a great army of the unidentified piled helter-skelter in the fields. The penniless "evicted" were hustled from parish to parish that the expense of burial might be avoided. Passing the buck is as old as humanity. Many in the agony of an undrained buboe killed themselves. One was seen to crush his skull against a stone wall. The inexorable old Thames extended surcease from pain and hunger to its "drowned." To quote Bell again: "Who shall believe that in the City and Liberties, where the pre-plague mortality averaged 205 weekly, there died in the week ending the 25th of July 628 *persons from causes other than the plague?*"

From now on mention of the plague occurs with but short intermissions, one assumes at each writing, for the entries are not made each day, but at frequent and quite regular intervals. The people grow "afeard." His coachman stumbles from his seat, "and is struck very sick and almost blind." He departs with "a sad heart for the man, lest he should have been struck with the plague." (June 16, 1665.) "All the towne almost going out of towne, the coaches and waggons being all full of people going into the country." "This end of the towne grows every day very bad of the plague. The mortality bill is come to 267." Thus ends June, the first month officially of the sickness.

JULY

July opened dry and hot, and with a mortality increase as irresistible as a tidal wave. Truly, all the town had gone out of town that possibly could. The city within the wall was almost deserted by those fortunate ones that could avail themselves of the only efficient remedy—flight. It is probable that London's scant half million was reduced one-fifth by her fugitives. The Court left following a royal proclamation for fast days to be observed in humiliation before God. The gay and careless Charles did not care to assume any of the Almighty's prerogatives. "For there is wrath gone out against us, and the Plague is begun. That dreadful arrow of thine sticks fast in our flesh" was the ritualistic form prescribed. The symbol of government and national integrity, a dissolute Court, had fled, and added measurably to the panic. The toll of the first week topped the total of June. The second week: "There dying 1089 of the plague this week. My Lady Carteret did this day give me a bottle of plague-water. . . . But Lord to see how the plague spreads." (July 20, 1665.) "The sad news of so many in the Parish dead of the plague, 40 last night, *the bell always going.*" (July 26, 1665.) The third week brought its toll of 1843 (Pepys says 1700). It has been said of Rousseau that he wrote his "Confessions" as though someone were looking over his shoulder. Not so Pepys, the frank. He finishes reading the depressing bill of the last week, "and so to bed full of the pleasure of these six or seven last days." Two thousand and ten (2,010)! A monthly total of almost six thousand. How little in the shadow of the weeks portending. A comparatively small month in figures, but a staggering one in the sum of human emotions. The horror was fresh in the hearts of all. Fear was acute, and emotional reactions cataclysmic in their intensity. For the first time our recorder betrays distrust in the quality of his own fine courage, even though his intimates and his family had deserted him. He has had the healthy egoist's sublime faith in his own personal immunity. He reacts with a chameleon-like facility that both astonishes and annoys: ". . . and put all my affairs in the world in good shape, the season growing so sickly, that it is much to be feared how a man can escape having a share with others in it, for which the good Lord God bless me." (July 3, 1665.) He has just returned from the Swan, and, in the same entry, admits in his doggerel French that he has dallied with the daughter of the Inn, "and spent a little time kissing her." "Among others to see my Lord B., who is not well. I did not see him, nor had much mind, one of the great houses within two doors of him being shut up." "The sickness is got into our parish this week . . . so that I begin to think of settling things in order, which I pray God to enable me to put both as to body and soul." (July 26, 1665.) "At noon home to dinner where I hear that my Will is come thither . . . ill of the fever, which put me into extraordinary fear, and I studied all I could to get him out of the house . . . without discouraging him." (July 29, 1665.) He piously ejaculated the following day: "The Lord of Heaven be praised for it, Will was with me today, and is very well again." He loves Will not less, but Samuel more. With a startling insouciance he ends the month with "after the greatest glut of content that ever I had [adding the saving afterthought] only under some difficulty because of the plague which grows mightily upon us." He had spent the month largely with close and influential friends in pleasant journeys and brave entertainments (of ante-nuptial flavor) and without cost of money. The pest-phobia was in abeyance most of the time.

AUGUST

Into August continued the blue, cloudless sky, the heat and the unaccustomed drouth. Climatic influences upon epidemic diseases had long been a fetish to conjure with, and the people chafed mightily because of the dilatory advent of the cool weather that would, they were sure, drive away the sickness as the morning sun dispels the dew. As far back as 1661 we note this entry: "It is a fast day ordered by Parliament to pray for more seasonable weather, it having hitherto been summer weather . . . which do threaten the plague (as all men think) to follow." Ten days following: "having been a fine frosty day—God send us more of them. . . ." "It continuing to be a great frost, which gives us hope for a perfect cure of the plague." (November 23, 1665.) "The weather hath been frosty these eight or nine days and so we hope for an abatement of the plague the next week . . . for the plague certainly will continue the next year if it do not." (December 22, 1665.) It is beyond argument that the plague had always diminished after the country had been firmly in the grip of the frost. One may theorize that the drouth, which dried up the inter-parish meadows and marshes drove the rodent denizens to the rotting laystalls and unkept streets and dwellings for food. Further, that the streams were sluggish and failed to care for the sewage, and that the lack of rain deprived the parched streets of the cleansing effect of the showers. Very reasonable until we find that the summer of 1625, when 34,000 deaths were tabulated, was a wet one and that there had been dry summers and wet summers before and after 1625 and 1665, without appreciable outbreaks of the plague.

It is interesting in the light of recent biological experiments to theorize regarding a climatic question that has been a matter of some conjecture to Bell. Pepys has made several references to the extreme heat of that summer; he says: "The hottest day that ever I felt in my life" and: "It was most extraordinary hot that ever I knew." Nowhere has Bell been able to verify this, Hodges having stated that the summer was refreshed with moderate breezes. Exhaustive studies upon the life cycle of the rat-flea have shown that very hot and dry weather is unfavorable to its development. It develops best under a moderate temperature with a high relative humidity. We are assured that it was a most successful summer from the standpoint of the "rat flea." We may assume then in the face of Kunhardt's experiments, that it was the mugginess of the summer days that made our plethoric Pepys so sweatily uncomfortable. *Post hoc, ergo propter hoc.*

Strange as it may seem, the untoward weather did not produce a famine in London. Possibly because of the greatly decreased demand, by reason of the hegira of the well-to-do. Fruit was plentiful, and large penny loaves were obtainable during the entire summer and winter. The people slunk about the streets suspicious of even their dearest friends. "But Lord to see among other things how all these great people here are afeard of London, being doubtful of anything that comes from thence . . . that I was forced to say that I lived wholly at Woolwich." He dare not go to Dagenhams "they being afeard of me." "Lord to see how I did endeavour all that I could to talk with as few as I could." Silence, that the sick be not disturbed, had been ordered, and indeed the poor people had stomachs for aught else. The bells were silenced. The shop-boys no longer shrilled to the passers-by: "What lack ye, what is't ye lack?" The raucous and myriad hucksters plied their trade in silence. The schools were closed; there was no staccato clatter of kiddies' feet to make happy ensemble with soprano hoots and cries. The City's great voice was muted. With bated breath we tiptoe after our guide lest we disturb the dying in the envisioned, gloom-enshrouded houses from which the pallid, questing faces of wondering children stare forth into infinity.

Pepys relates the incident of some gay young sparks abroad upon a country road. Espying a coach with curtains carefully drawn, and scenting an amorous intrigue, one stuck his inquisitive head through the window, "and there saw somebody look very ill, and in a sick-dress and stunk mightily." When informed that it was an unfortunate maid, ill of the plague, and being conveyed to the pest-house, "the young gent went into a fright that near cost him his life." (August 3, 1665.) This incident, unsavory, but innocent of itself, introduces to us the impossibility of enforcing the often and necessarily stringent and cruel restrictions. The sick maid was not being conveyed in a properly designated plague-coach or plague sedan-chair, and probably none was available at the time. Had there been, it is possible that one of the young blades would have peeked, notwithstanding. Early in the epidemic, and during September's "peak" when mob-rule flared forth at times, the seals were broken on the Red-Cross houses, and the inmates delivered. They could not be restrained from the morbid comfort of following their dead to their graves. Wakes they could not and would not forego, when a watcher could be bribed: "to consider the madness of the people of the town, who will, because they are forbid, come in crowds along with the dead corpses to see them buried." (September 3, 1665.) "And strange to see two or three burials upon the Bankeside, one at the very heels of another, and doubtless all of the plague, and yet at least forty or fifty people going along with every one of them." (September 6, 1665.) "A Mr. Caesar, having remained at Westminster during the whole of the sickness, tells me, in the height of it, how bold people there were, to go in sport to one another's burials; and in spite too, ill people would breathe in the faces (out of their windows) of well people going by." (February 12, 1666.)

Chroniclers of the plague have been horrified because nurses anxious to close the affairs of the suffering family, for reasons of personal gain, had touched the well with dressings and exudates of plague sores. The intent was vicious, the results nil. The bubonic plague is but very slightly infectious and experiments have proved that the infective material must be injected deeply in the skin, as in a flea-bite. It is essentially a blood disease, the bacilli multiplying and developing their virus in that medium.

Magistrates were permitted to issue health certificates, and the abuses may be conjectured in a country of "classes." Pepys evaded the laws. Fresh from the London streets, "To Greenwich where much ado to be suffered to come into the town because of the sickness, for fear I should come from London, *till I told them who I was.*" (September 3, 1665.) A naïve admission! Scotland, canny always, refused to let down the bars to England. In all Scotland there was no plague. The country was constantly, and with reason, at war with the city. Let the unhappy story of Coome's Farm tell us why. We quote from the Diary without addition or embellishment. He fears to pass the Coome farm because of the dogs and the rogues by the way:

> And yet more because of the plague that is there, which is very strange, it being a single house, all alone from the towne, but it seems they use to admit beggars, for their own safety, to lie in their barns, and they brought it to them. [August 22, 1665.]
>
> . . . And walked to Greenwich, in my way seeing a coffin with a dead body therein, lying in an open close, belonging to the Coome farme, which was carried out last night, and the parish have not appointed anyone to bury it; but only set a watch there day and night, that nobody should go thither, or come hence, which is a most cruel thing: this disease making us more cruel to one another than if we are doggs. [August 23, 1665.]
>
> But it troubled me to pass by Coome farme where about twenty-one people have died of the plague.

The most thorough quarantine in England was enforced for somewhat selfish purposes. Charles and his court arrived in Oxford late in September after the "peak," and had had established about their august selves every possible protection. All citizens not necessary to their comfort and the conduct of the community were summarily excluded, and without appeal. The Commons assembled for business, and to frame modern plague measures. This plague bill was submitted to a committee of lords, doctors, bishops, and in fact the intelligentsia and flower of England. For arrant stupidity and as the apogee of selfishness the incident is characteristic. An agreement could not be reached because, perforce, the lords insisted upon inhibiting the building of pest-houses, and the location of burying-grounds near the houses of peers; and further that "*persons of note and quality*" should have their residences exempted from search and quarantine closure.

On the twenty-eighth of August, Pepys, depressed by the silent streets occupied by only the pathetic few "looking like people that had taken leave of the world," decided to close his house and join his wife at Woolwich, his offices having been previously removed to Deptford. "Thus I think to take leave of the Londoñ streets." (August 28, 1665.)

> Up, and after putting several things in order to my removal to Woolwich, the plague having a great increase this week. . . . The plague above 6000. Thus this month ends with great sadness upon the publick . . . every day sadder and sadder. . . . [August 31, 1665.]

Twenty thousand and thirty plague victims against July's 6000. August's last week, 6103, exceeded July's total.

THE VENGEFUL HAND

The lame, the halt, the sick and "spotted," the convalescent, one breath from Death's yawning door, and the dead were omnipresent.

> I met a dead corps of the plague in the narrow alley. . . . But, I thank God I was not much disturbed at it. However, I shall beware of being late abroad again. [August 15, 1665.]
>
> Thence with a lanthorn, in a great fear of meeting of dead corpses. [August 19, 1665.]
>
> Went forth . . . to see (God forbid my presumption) whether I could see any dead corps going to the grave . . . But Lord, how anybody looks, and discourses in the street is of death, and nothing else. [August 30, 1665.]

Here Freud's dream factors of fears and suppressed desires are apparently inextricably confused. Six weeks later the diary reads: "Came close by the bearers of a dead corpse of the plague, but Lord! to see what custom is that I am come to think almost nothing of it." (September 9, 1665.) Like vice, first pitied then endured:

> Thence I walked to the tower, but Lord! how empty the streets are and melancholy, so many poor sick people in the streets full of sores, and so many sad stories overheard as I walk, everybody talking of this dead and that man sick. [September 16, 1665.]
>
> . . . And he and I in his coach through Kente-Streete (a sad place through the plague, people sitting sick and with plaisters about them in the streets begging.) [October 14, 1665.]

BURIAL OF THE DEAD

> I was much troubled this day to hear . . . how the officers do bury the dead in the open Tuttlefields pretending want of room elsewhere; whereas the new Chappell churchyard was walled in at the public charge in the last plague-time, merely for the want of room and now none, but such as are able to pay dear for it are buried there. [July 18, 1665.]

This entry is but an intimation of petty graft. Our repugnance for the wholesale disposal of the dead seems untranscendable, yet we are conscious of a further flick upon the raw when we dwell upon that soulless and sordid coterie known as the "brokers of the dead," that connived with the nurse-keepers and watchmen to either steal or buy for a pittance the poor effects of the devastated households.

> There goeth a tankard that shall infect the fifth cupboard; here a set of spoons that taint the hundredth dish of broth; this man steals a bargain of a cloak that kills ten men; . . . In vain do you here object the severe laws against the removal of infected goods before the forty days are past, when the careful nurse does not stay the forty hours, lest a rightful owner interpose, or cunning lawyer seize on the house or estate.

Even the overwhelming magnitude of the calamity was not sufficient to burn out the dross in the evil, in whom no residue of gold obtained. The "poore," poor devils, asked but little after all, burial in hallowed ground away from the awful pits. A physical impossibility. The churchyards had already attained a new elevation from surface burials: "It frightened me indeed to go through the church more than I thought it could have done, to see so many graves be so high upon the churchyards, where people have been buried of the plague." (January 30, 1660.)

Under the canons of the Church, ground not dedicated in perpetuity could not be consecrated. Deaths became so frequent that it was impossible to care for the dead the same day. The nights were no longer long enough. "The people die so that now they are fain to carry the dead by daylight."

Corpses lay piled in the fields like faggots until such time as they could be thrown indiscriminately, hurriedly and uncoffined into the common graves, as disclosed by recent excavations of old pits. In "God's Terrible Voice in the City," Vincent says:

> Multitudes! Multitudes! in the valley of the shadow of death, thronging daily into eternity. The churchyards are now stuffed so full with dead corpses that they are in many places swelled two and three feet higher than they were before, and new ground is broken up to bury the dead.

And in the Diary: "He is mighty solicitous, as I find many about the city that live near the churchyards, to have the churchyards covered with lime, and I think it is needful, and ours I hope will be done." (January 31, 1666.) The ordinance above referred to was impossible of fulfillment because of insufficient lime and a scarcity of labor.

SEPTEMBER

The high point of our graphic chart. Parched underfoot. Cloudless overhead. Humid and portentously depressing. With the glaring inconsistency which characterizes our guide, and which we have learned to accept with a degree of equanimity, he opens the month with flippant reference to his attire:

> Up; and put on my coloured silk suit very fine, and my new periwigg, bought some time since, but durst not wear, because the plague was in Westminster when I bought it, and it is a wonder what will be the fashion after the plague is done . . . for nobody will dare to buy any hair, for fear . . . that it had been cut off the heads of people dead of the plague. [September 3, 1665.]

He had spoken twice previously of returning periwiggs "in anger" because he had found them to be lowsy. The times had not changed since the Virgin Queen with her thousand gowns and not a single bathtub. The following day he mentions having written to Lady Carteret "telling her of the state of the city as to health and other sorrowful stories." This letter is not a part of the Diary, but appears in the Braybrooke edition and is his best plague bit. Poignantly epitomized, clear and brief, it discloses the true Pepys beneath the jaunty periwigg:

> I have stayed in the city until above 7400 died in one week, and of them above six-thousand of the plague, and little noise, heard day or night but tolling of bells; till I could walk Lumber Street and not meet twenty persons from one end to another, and not above fifty upon the Exchange; till whole families, ten or twelve together, have been swept away; till my very physician, Dr. Burnett, who undertook to secure me against the infection, having survived the month of his own house being shut up, died himself of the plague; till the nights though much lengthened, are grown too short to conceal the burials of those that died the day before, people being thereby constrained to borrow daylight for that service; lastly till I could find neither meat nor drink safe, the butcheries being everywhere visited, my brewer's house shut up, and my baker with his whole family dead of the plague. Yet, Madam, through God's blessing, your poor servant is in a perfect state of health.

On the seventh, he "sent for the Weekely Bill . . . 6978 of the plague." One thousand a day! In desperation fires were ordered burned in the streets, one at every twelfth house: "Thence by water . . . all the way fires on each side of the Thames." In the week that the fires burned came the first decrease since the inception of the illness four months previously—aeons ago to the unhappy people: "the decrease of 500 and more, which is the first decrease we have yet had in the sickness since it begun." (September 14, 1665.) It is recorded that the fires were extinguished by the long-deferred rain. Can we even venture to imagine the joy and relief experienced at this change? We wonder if that episode of the fires in the streets has become confused through the long years with the "Great Fire," and if it was the source of the misinformation that is so universal as to have become axiomatic, e.g., that the Great Fire burned out the plague, and was probably of incendiary origin for that very purpose. Lewis Melville, in his "Nell Gwyn," just off the press, makes the following bald and apochryphal statement: "The Great Fire of London, which raged from September 2, 1666, for four days and devastated some four hundred acres, purified the air and so drove away the Plague." The Great Fire occurred one year after the high point. The total of plague deaths in London during the entire year of 1666 was but 1780, a scant two days total during the fastigium. The fire consumed a large portion of the city within the wall, and considerable without, but it missed altogether St. Giles, Stepney, St. Margaret's, and Cripplegate, parishes that had been the greatest incubators of all. It was, without doubt, a very considerable influence in the ultimate diminution of the sickness, having been the genetic factor in the birth of a sanitary conscience and a centralized sanitary control. The burned areas were rebuilt with some regard for decent cleanliness, and these parishes in turn were examples for others to "clean up and clean out."

Tucked obscurely away in the chronicles of September 14, we find the following significant item: ". . . there being now no observation of shutting up of houses infected."

It is assumed that all are informed that the rat-flea is the carrier of the *Bacillus pestis;* that the bubonic form of the plague, which is the form now concerning us, is but very slightly infectious, quite contrary to the less frequently prevalent pneumonic type, and that the disease is carried from host to host by the ubiquitous flea. Kunhardt by a most ingenious series of experiments has proved that the rat-flea is not a traveller. It awaits its new victim at the very spot in which its erstwhile host succumbed. This knowledge satisfies us that the illness in question is a house disease, and that the vicious results of the forty days' quarantine are beyond conjecture. A supposedly beneficent provision utterly vicious in its application. Flight was the only certain refuge for the uninfected.

RATS

It is curious in view of the fact that the connection of rats with epidemics of a bubonic nature was clearly delineated in the Old Testament[2] and the Bhagavat Parana,[3] that we have been able to find but two references to them in the literature of the period. Robert Long, a crown official, wrote to his butler:

> I pray you use all possible care to preserve yourselves and my house. . . . Lett not the porter come into the house; take all course you can agaynst the ratts, and take care of the catts; the little ones that will not stirre out may be kept, the great ones must be killed or sent away.

Doubtless the honorable Auditor classed rats under the blanket term of "vermin," which included also dogs and cats. Had he attributed any particular malignance to the "ratts," he would have cherished the "catts" even unto the "great ones."

Boghurst, the apothecary, mentions them, though probably without intent of etiological prescience, in dilating upon the popularity of arsenical amulets, "and sure the rat-killers will have a great trade next year, the Arsenick and Ratbane being all spent and the cats killed."

The chill damp air failed to bring the relief so long and vainly prayed for. The disease became increasingly virulent. Those infected the third or fourth time quickly succumbed, so we are informed. It is difficult to believe, however, that immunity was not conferred for even a short interval. The bravest and most optimistic were crushed when, with the return of fair weather, came the most appalling bill of all. From hope to despair and the slough of despond! "But worst of all . . . the number of the plague this week; that it is encreased about 600 more than the last, which is quite contrary to all our hopes and expectations . . . of the plague 7,165." (September 20, 1665.) The acme had been reached, and the welcome lysis was to arrive at last: "Here I saw this weeks Bill of Mortality, wherein, blessed be God, there is above 1800 decrease, being the first considerable decrease we have had." (September 24, 1665.) The following item in the notes of the twenty-ninth is mentioned only to point out how truly sickness was called the "poore's plague." The rich and well-to-do, in a very large measure, suffered only financially and socially. Their homes and streets were comparatively clean and rat free, and flight was for them always possible. There was no decimation, and in many cases no invasion, of the ranks of magistrates, parliamentarians, and high government officials: ". . . that Sir Martin Noell is this day dead of the plague in London."

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[2] "Wherefore ye shall make images of your emerods (swellings, buboes) and images of your mice that mar the land; and ye shall give glory unto the God of Israel; peradventure he will lighten his hand from off you." 1 Samuel, Chap. VI.

[3] "When a rat falls from the rafters and acts in a drunken condition and dies, the plague is at hand."

Thus ends the depressing chronicles of that drear and drab September. Twenty-six thousand, six hundred and fifty-two victims of the pestilence. Victims duly registered by overworked clerks and sextons. Heaven only knows how many went unnoticed to the pits.

With the turning leaves of October's cool autumn days came a steady decrease in mortality. Infections were many, but the virulence was attenuated. The rebound in the spirits of the people was instantaneous: "The 'Change pretty full, and the town begins to be lively again, though the streets are still empty, and the shops most shut." (October 26, 1665.)

The people were returning to "beds not yet cold," for an increase is noted in November: "The Bill of Mortality, to all our griefs, is encreased 399 this week, and the encrease generally through the whole city and suburbs. . . ." (November 9, 1665.)

The following week he notes the resumption of the down-curve that was to continue without interruption of moment from then on. "The plague is decreased 400. . . ." (November 15, 1665.) "The plague is come very low . . . a hard frost has come, and continues freezing." (November 22, 1665.)

As the city began to live once more, Pepys' insatiable curiosity was unleashed, and he nosed again in the old familiar manner about the London streets: "I hear that my pretty grocer's wife, Mrs. Beversham . . . her husband is lately dead of the plague . . . which I am sorry for, for fear of losing her neighborhood." (November 24, 1665.) A somewhat questionable and vicarious sympathy for the deceased. He stopped at his "old oyster shop . . . bought two barrels of my fine woman of the shop, who is alive after all the plague which now is the first observation or inquiry we make at London concerning everybody we knew before it." (November 26, 1665.) That the oysters came from Colchester, "where the plague hath been so much" concerns him but little. The Colchester epidemic was the premonitory rumble of the plague that swept over the south of England during the following year.

Stimulated by the returning clatter of the filling town he does "resolve to remove home soon as we know how the plague goes this week." The month closed "with but 333 of the plague." (November 30, 1665.)

The frosty days continued into December with another increase in mortality: "The plague is encreased again this week, notwithstanding there hath been a day or two of great frosts." (December 13, 1665.) "The sickness is above 80 this week." Again the curve dropped ". . . with great content that the plague decreased to 152." (December 29, 1665.) "But now the plague is abated almost to nothing, and I intending to get to London as fast as I can." (December 31, 1665.)

In his summing-up for the year, Pepys again incurs the scathing displeasure of one of his critics. Bell depicts the entire grateful citizenry as having been genuflected in the churches or the solitude of their own closets in humble thanksgiving, while the ungodly Pepys counted his ill-gotten gold.

> Thus ends the year to my great joy. . . . I have raised my estate from £1,300 in this year to £4,400. . . . It is true that we have gone through great melancholy because of the great plague, and I put to great charges by it, by keeping my family long at Woolwich, and myself and another part of my family, my clerks, at my charge at Greenwich, and maybe at London; but I hope the King will give us some satisfaction for that. . . . I have never lived so merrily (beside that I never got so much) as I have done this plague time. . . . My whole family hath been well all this while, and all my friends I know of, saving my Aunt Bell, who is dead, and some children of my cozen Sarah's, of the plague. But many of such as I

> know very well dead; yet to our great joy, the town fills apace, and shops begin to be open again. Pray God continue the plague's decrease! for that keeps the court away from the place of business, and so all goes to rack as to public matters. . . . [December 31, 1665.]

Bell witheringly remarks "The faithful servant has been rewarded." Again Pepys' apparent callousness is mitigated by his unusual frankness. Also, he was ever sensible of the incongruity of his joy in life, and his worldly gain in the face of the suffering all about him. On September 14, on reflecting upon the success of his business affairs, he says: "Where . . . I spent some thoughts upon the occurrences of the day, giving matter for as much content on one hand and melancholy on another, as any day in all my life."

On this day he confided to his Diary his longest homily on the plague. Lack of space prevents its repetition, but it clearly indicates the sincerity of his grief. Ten days later: ". . . it having pleased God in this sad time of the plague everything else has conspired to my happiness and pleasure more for these last three months than in all my life before in so little time."

January and the New Year brought the joyful news of the lowest total mortality that London had enjoyed in twenty years. How illy this prepared them for an unexpected rise in the plague mortality, it having jumped in the second week from seventy to one hundred fifty-eight! As in November and December, it dropped at the end of the month.

Pepys describes his homecoming graphically and almost dramatically:

> I with my Lord Bruncker . . . by coach with four horses to London . . . But Lord! what staring to see a nobleman's coach come to town. And porters everywhere bow to us; and such begging of beggars! And a delightfull thing it is to see the towne so full of people again as now it is; and shops begin to open, though in many places seven or eight together, and more, all shut; but yet the towne is full compared with what it used to be. I mean the city end; for Covent-Garden and Westminster are yet very empty of people, no Court nor gentry being there. [January 5, 1666.]

The King came down to Hampton Court to confer with Albemarle on matters of state, and learned "that there was a strong and universal joy in the capital from his being so near."

> To my great joy people begin to bustle up and down there, the King holding his resolution to be in towne tomorrow, and hath good encouragement, blessed be God! to do so, the plague being decreased this week to 56, and the total to 27. [January 31, 1666.]

Charles did return on February 1, welcomed by the pealing of the selfsame bells that had so tragically and lugubriously tolled the passing of the loyal subjects, whom he had so carelessly neglected. He was the harbinger of returning prosperity.

From thence on occurred an occasional flurry in the weekly bill, with expressed apprehension that there might occur the dreaded hot-weather increase. Not so, however, for which our diarist piously thanks God. Two hundred and twenty-two of plague in February, and 107 in March.

It is astonishing to find that it is of record that the birth-rate of London two years after the epidemic was greater than before its incidence, so quickly did the country fill up the ranks depleted by the hundred thousand dead.

> So home, and there do hear . . . that Greenwich is at this time much worse than ever it was, and Deptford too; and she told us that they believed all the towne would leave the towne and come to London; which is now the receptacle of all the people from all infected places. God preserve us! [October 6, 1666.]

Mention of Deptford, the "miserable village" of Evelyn's description, and the home of the Naval Dockyards, is very frequent. The little town lost over 500 from the pest during 1666, one-third of London's total for that year. The village is evidently as wretched as of yore, for a recent contributor to the *Atlantic* states that the health-officers are interesting themselves in the report that the village boasts but one bath-tub to a hundred homes.

Though plague deaths occurred for some weeks after November 20, 1666, that day marks the official ending of the Great Plague and our story thereof.

> . . . And then to church, it being thanksgiving-day for the cessation of the plague, but Lord! how the towne do say that it is hastened before the plague is quite over, there dying some people still, but only to get ground for plays to be publickly acted, which the Bishops would not suffer till the plague was over.

Two centuries passed before the Victorian era, when the radiance of the immortal Pasteur dispelled the Egyptian darkness of the centuries. Until then the civilized world knew little more of epidemiology than did Pepys and his world. When a recrudescence was feared in May, 1666, because of impending hot weather, the officials recommended the abolition of the forty-day quarantine, and the erection of adequate pest-houses. We have already shown that they recognized the danger of public gatherings; the necessity of fuming infected houses, and the burning of infected bedding. They had a fair conception of quarantine, and vague ideas upon the danger of "vermin," the accumulation of filth and climatic influences. So had they a knowledge of all these things at the time of "the plague of Thucydides," some 400 years B.C. Even the building of fires in the streets was practiced in Athens during that epidemic.

Not until 1894 did Kitasato discover the *Bacillus pestis*, and several more years were to pass before the rat and its parasitic flea were to be indicted and convicted.

Let us pass now to a plague epidemic in an American city in 1924; a city twice as large as was London in 1665. The weather was hot. The infected district was a crowded one. Again it was the "poore," and the rats were there. The disease was of the infinitely more infectious type, the pneumonic. The same devastating mortality percentage prevailed, yet the deaths totalled but some thirty odd. Why this difference? The sanitary government was adequate, and experimental biology had taught us how and why the plague was conveyed from one to another. London sacrificed 25,000 babies upon the altars of ignorance; modern science substituted rats and guinea-pigs. Yet the ingrained superstitions of the dark ages have left their "little rift within the lute" of our scientific perfection. We hear jeremiads anent the suffering (imaginary) of the pellucid-eyed rats and the ducky guinea-pigs by those for whom London's babies died in vain. The amulets are replaced by "spinal adjustments." "The phylosophycall gold" yields to "non mucus-forming foods." With feet firmly planted in the mire of willful ignorance, the fatalists in the guise of religious zealots launch apostrophes and panegyrics towards the throne of the deity of their own vain imaginings.

Vale, the poore's plague! Vale, Pepys!

BIBLIOGRAPHY

WHEATLEY, H. B. The Diary of Samuel Pepys. N. Y., 1918.
Samuel Pepys and the World He Lived in.
Pepysiana
TANNER. Mr. Pepys.
BRADFORD. The Soul of Samuel Pepys.
MOORHOUSE. Samuel Pepys, Administrator, Observer, Gossip.
The Diary and Correspondence of John Evelyn.
LUCAS-DUBRETON. Samuel Pepys.
LUBBOCK, P. Samuel Pepys.
WALFORD. Old and New London.
BELL. The Great Plague in London.
BOGHURST, W. Loimographia. Edited by Paine.
FORSTER, T. Epidemia.
HECKER. Epidemics of the Middle Ages.
Milroy Lectures. *Brit. M. J.*, Lond., 1924.
DEFOE, D. Journal of the Plague Year.
MELVILLE, H. Nell Gwyn.
POWER, D'ARCY. The Medical History of Mr. and Mrs. Pepys. *Lancet*, Lond., June, 1895.
AINSWORTH. Old St. Pauls.
COLE. English Dictionary. 1677.
KNIGHT, C. London.
LISTER, T. H. Life of Clarendon.
BESANT, W. London in the Time of the Stuarts.
Occasional Papers. Samuel Pepys Club. Lond., 1917.
CRAWFURD, R. Plague and Pestilence in Literature and Art.

DR. BERNARD DE MANDEVILLE AND HIS FABLE OF THE BEES*

By JAMES HENDRIE LLOYD, M.D.

PHILADELPHIA, PA.

DR. Bernard de Mandeville was a London physician of the early eighteenth century, but he was not an Englishman. He was born in Rotterdam in 1670, the son of a physician, and took his medical degree at Leyden in 1691 with an inaugural thesis "De Chylosi Vitiata." Soon after graduating he settled in London and learned English to such good purpose that he became a master of English prose, able to hold his own with the best writers of his day. He wrote much, but is best known to fame by his "Fable of the Bees." All that is characteristic of him as a philosopher and humorist is to be found in that work.[1]

Mandeville was an early example of the doctor in literature. Like Sir Thomas Browne his bent was philosophical. Instead of writing a novel, or a biography, or a volume of essays, as some of our more ambitious doctors do, he wrote a satire, which if well interpreted goes to the roots of many of our present problems. This satire is still fresh; it is two hundred years young. It deals with social and political problems, as well as medical, and has the distinction of having attained a greater age than falls to the lot of the writings of most medical men. It is not probable that the lucubrations of many of us will survive and be discussed two centuries after we are dead. But so it has been with Mandeville's little satire, which only recently has been gravely expounded by Sir Leslie Stephen[2] and his brother, Sir Fitzjames,[3] as a noteworthy product of eighteenth century thought. And here the question arises: why should we not acclaim a physician whose writings or activities sometimes overstep the boundaries of pure medicine? There are not a few such, and some of them have been distinguished men. In general literature we have the recent examples of Oliver Wendell Holmes and Weir Mitchell; while in politics there is the unique career of that other Philadelphia doctor, Benjamin Rush, who sat in the Continental Congress and signed the great Declaration. So I shall not trouble you with an apology for directing attention to Mandeville and his "Fable of the Bees," although I forewarn you that it is not a medical fable.

This fable is the story of a Grumbling Hive of Bees:[4]

A spacious Hive well stocked with Bees,
That lived in Luxury and Ease....
No Bees had better Government,
More Fickleness, or less Content....
Every Part was full of Vice,
Yet the whole Mass a Paradise.

In this community, where every bee worked for his own happiness and welfare, Sin and Luxury employed a million of the poor; Envy and Vanity assisted Industry; Folly and Fickleness in Fashions were the wheels of trade; Waste and Extravagance stimulated business, and to such a height that the very poor lived the better for it. In brief, the hive was a little world, or state, wherein the prime motive was self-love or self-interest. This made the wheels go round; this kept everyone busy. It was a microcosm of Main Street, such as we are told is to be seen everywhere today in the United States. There were even lawyers among the bees, but they were pettifoggers; doctors, who were no better than charlatans; and clergy, who were fat and lazy. But the politicians were the most corrupt of the whole lot. Finally the bees could stand it no longer. They became discontented with their lot; they were scandalized by their own faults, and began to clamor for reform. In consequence "sermonizing rascals" began to raise their voices. These fellows were the uplifters among the bees. They agitated and prayed for reform, till

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* Read before the Section on Medical History of the College of Physicians of Philadelphia, March 29, 1926.

[1] Encyc. Brit., vol. xv, article on Mandeville.

[2] Stephen, Sir L. Essays on Freethinking and Plain Speaking. N. Y., p. 277.

[3] Stephen, Sir J. F. Horae Sabbaticae.

[4] The Fable of the Bees; or Private Vices, Public Benefits, 2d Ed. Enlarged with many Additions. As also an Essay on Charity and Charity Schools. And a Search into the Nature of Society. London, Printed for Edmund Parker at the Bible and Crown in Lombard St., 1723.

> Jove, with Indignation moved,
> At last in Anger swore, He'd rid
> The Bawling Hive of Fraud, and did.

Straightway the hearts of the bees were "filled with honesty and all the virtues, strict justice, frugal living, contentment with little." They became pacifists, and endured the insults of their enemies. They were altruists, and worked not for themselves but for others. The result was disastrous. They languished and most of them died; until the wretched remnant, no longer able to keep the old hive going, flew to a hollow tree, where they probably perished, too good to live in such a world as this.

The moral of this tragic tale, as Mandeville meant to point it, is obvious. He boldly proclaimed that private vices were public benefits. But by "vices" he meant not merely immoralities, but all acts that spring from self-interest, and by "virtues" he meant the contrary, that is, the actions which are supposed to have their motive in universal benevolence. All this was demonstrated by him in a series of notes in which he discussed the principles that underlie human society, and reduced everything to selfish or sordid motives in a furious and rampant struggle for existence; and this he did with a cold-blooded cynicism which excited the wrath of his critics.

The immediate effect of his book was to raise a storm, which was probably what Mandeville intended. The grand jury of Middlesex presented the book to the justices as being of an immoral and pernicious tendency, and a copy was condemned to be burnt by the common hangman, a distinction which has probably been attained by the writings of few other medical men. A story was even printed in a newspaper of the day, that a gentleman, well dressed, appeared at the bonfire before St. James Gate, who declared himself the author of the book; that he was sorry for writing the same, and pronounced the words: "I commit my Book to the Flames," and threw it in accordingly. But Mandeville took pains to deny this newspaper canard, for which some clerical gentleman appears to have been responsible. This same churchman charged that Mandeville had merely collected and digested the false notions of Machiavelli, Hobbes, Spinosa, and Bayle. This may have been true, in part at least, as it is plain that Mandeville was merely attempting a satire on some of the ethical speculations of his day, and his critics may have mistaken him. From the pain they evidently suffered it looks as though he got under their armor.

As to the literary quality of this so-called poem, a word only need be said. The little piece was not much more than a skit. It was indeed mere doggerel, but it was clever doggerel. Mandeville himself says he did not know what to call it, and he hesitated to dignify it as a poem. He calmly notes that his critics had found fault with his bad reasoning, and had said of his book that it was ill-wrote, that there was nothing new in it, that it was incoherent stuff, the language barbarous, the humor low, and the style mean and pitiful. This was saying a good deal, and reflects the literary amenities of the time; but the imperturbable Mandeville replied that in the main he believed they were right, and went on his way unruffled.

To understand Mandeville it is necessary to take into account his times.[5] It was a period of great mental activity, or speculation, especially on social and political problems, also in philosophy and theology. Such writers as Hobbes, Locke and Shaftesbury had compelled thinking men to take account of their mental stock, to know themselves, and to give some reasons for the beliefs that were in them. The physical sciences, including medicine, felt the stimulating effects of this criticism. Locke himself had studied medicine; and his great "Essay on the Human Understanding" follows a kind of physiological method and was really the first scientific treatise on psychology. Mandeville was clearly under Locke's influence, as shown by his method of analyzing human motives. He was a scientist and realist, not an idealist. He looked at things as they were, not as he would like them to be, and especially not as the idealists and sentimentalists are forever telling us that they ought to be; and he was a realist because he was a physician and had an instinct for diagnosis. We can see in his work the hints of a new school of ethics, of the rights of the individual versus the state, of modern political economy and industrialism, as well as sidelights on some of those speculations, often extravagant, especially in France, which were to lead in time to the American and French Revolutions. This is the merit of his piece, and it is of special interest to us because the author was a physician.

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[5] This subject is very fully discussed by F. B. Kaye in his recent elaborate edition of Mandeville's Work. 2 vols., Oxford, 1924.

He was cynical, but good-humoredly so. His cynicism need not offend a discriminating reader. It was merely put on as a mask and worn for the occasion. He had both humor and insight, and herein he differs from our dreadful fanatics, who always take themselves too seriously. He resembles Montaigne or La Rochefoucault, but never Volstead or Bryan.

The Bees came to grief because they ignored the inexorable laws of Nature, which underlie the state and human society. They tried to set up a Utopia, but like all Utopias and New Jerusalems, it did not work. There is perhaps a moral here for our present time.

It is curious to follow out some of Mandeville's paradoxes. The chief of these was the thesis that "Private Vices are Public Benefits," which was boldly printed on his title page. It was this bald statement which shocked his adversaries out of their wits, and led some of them to denounce him almost as a reprobate and a public enemy. But it is easy enough now to see what he meant by it, and it need not frighten anybody. By "vices" he meant simply all the motives that arise out of self-interest; the competitions of commerce, the scramble for wealth and luxury, and the rivalries that are inevitable in human life, both in peace and in war. He laughed at Shaftesbury's idea that benevolence is, or ought to be, the mainspring of human action. Universal benevolence has never been the motive which has driven men to labor and to sweat. Mandeville has no taste for reformations, and scoffs at the attempts to banish selfishness, pride and luxury, and to make people universally charitable, humble and virtuous. To do so, he thinks, you must abolish trade, politics, printing and all the other instrumentalities of civilization, and pass sumptuary laws, such, I suppose, as our prohibition. In other words, he sees everywhere in human life the struggle for existence and the survival of the fittest. This is merely a foreshadowing of Darwinian evolution, and Sir Leslie Stephen is right when he says that some of Mandeville's statements have a curiously familiar sound. Nowadays the followers of Darwin write such things as the commonplaces of science.

In the same spirit he criticizes the military virtues, such as bravery and the quixotisms of chivalry, and says that they are merely founded on pride, rivalry, ambition, and even on cowardice; and he girds at the military life in a way that ought to rejoice our modern pacifists. Nevertheless, Mandeville is no pacifist. He evidently believes in war as a necessary evil, and does not blink the facts.

But his medical instincts never fail him. When he discourses on the military virtues he ascribes them to the so-called "constitution," that is, the emotions and the temperament, which for him are due to an orderly mixture of the "fluids" of the body. Bravery, he tells us, is due to these fluids when they are properly mixed. Fright and timidity are merely a perturbation of these fluids. This is not unlike the doctrine of the emotions as expounded by some of our twentieth century physiologists. The emotions are merely a matter of our internal secretions and our sympathetic nervous system. They are not primarily mental; they are physical, or what you call polyglandular. These "fluids" which Mandeville talks so glibly about are nothing but our modern hormones, and his doctrine is only the endocrinology of two hundred years ago. We are, in fact, today returning to something like the old humoral pathology, and some of the writings of our modern endocrinologists sound almost as though they were taken bodily out of the pages of Galen.[6] So Mandeville was not far behind the times. He even has a word to say about the repressed emotions in a truly Freudian way, and he hints at a defense-reaction in a sentence that would please our present psychoanalyzers.

His worst heresies were on the subject of education. He arraigned the Charity Schools of his day, which were the predecessors of our public schools. He evidently did not believe it was possible, or desirable to attempt, to educate everybody; and he seemed to think that the great mass of mankind was destined to labor with their hands, not with their brains. To interfere with this was to offend a law of Nature. Such shocking sentiments are not unheard even yet in England among a certain brand of Tory writers, like George Saintsbury. But in this country we have more liberal ideas. A well-known educator of Philadelphia recently expressed the wish that he might live to see a university in every ward, but he did not tell us who was to pay for them, or what standards of education they were to maintain.

One of the queerest of Mandeville's paradoxes was his notion that the more business and industry there was in a city, the more dirt, disorder and discomfort there would be on its public streets, and he pointed to the London streets of his time as a proof of this. He seemed to think that the only way you could clean up a city was by abolishing its industries. What our public hygienists would say to him is easily imagined; but he would probably reply to them by pointing to our manufacturing towns in their dirt, squalor and mantle of bituminous smoke, and he would tell us that our Utopias cost too much money. For example, a project was recently discussed to give Philadelphia a model sewerage system, which would have cost $200,000,000. This would have exceeded the utmost borrowing capacity of the City, and was clearly impracticable, but it would no doubt have been a very pretty sewer.[7] Our state and municipal expenses in this country are mounting up at such a rate that no man can foresee the end.

It is just reported that the birth-rate in New York City has been falling steadily for some years, and good authorities ascribe this to the housing conditions. A young married couple, forced to live in a narrow suite of rooms on the fifth or sixth floor of a modern apartment house, cannot afford to have babies; they would have no place to put them, so they do not have them. They are solving for themselves the problem of birth-control, which is one of the favorite schemes of our eugenists. In the meantime an immigrant population has been pouring into the country by the millions, and breeds like rabbits. The effect of this on the future population of the country can possibly be figured out by those who have made themselves expert in juggling with the Mendelian laws of inheritance. Mandeville knew nothing about these laws, but he knew something about the populace and its ways.

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[6] Galen. On the Natural Faculties. Translated by A. J. Brock, M.D. Loeb Classical Library, pp. 183–185; 167; 209.

[7] *The Listening Post*, Jan., 1926, p. 10. This is the official organ of the Pennsylvania State Department of Health.

If Mandeville were here today he would probably tell us, in his blunt way, that the modern tyrant is the State; that for the divine right of kings we have substituted the divine right of majorities; and that the State assumes the right to control our purse, our business, our education, and our morals. We must not drink, and we must not teach evolution in the schools—that hateful Doctrine of Evolution, which hurts our tender sensibilities too much.

I am not an apologist for Dr. de Mandeville, but I confess I rather like him. He is a good antidote to the strident optimism of our times. He has such a frank way of looking the world in the face, and telling it just what he thinks of it. He seems to bid his readers clear their minds of cant, and stop using fine phrases. In this he but anticipated Thomas Carlyle. He even won the approval of Dr. Samuel Johnson, who said, according to Boswell, that Mandeville had opened his views into real life.[8] The man who could do this must have had in him something of the seer, however he might disguise his aims in the rôle of the cynic.

The Bees prayed for a Utopia, and Jove let them have it. The result was disastrous. For us to reason from this and to attempt to apply the moral to ourselves might of course lead us into error, because analogies are often misleading, but it may at least suggest the amusing thought that, what with our reformers, uplifters, pacifists, prohibitionists, eugenists, educators, and trade-unionists, we may yet, like Mandeville's bees, reform ourselves off the face of the earth.

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[8] Boswell's Life of Johnson; Ed. by A. Glover, II. 434.

SIR WILLIAM LAWRENCE*

IN RELATION TO MEDICAL EDUCATION WITH SPECIAL REFERENCE TO OPHTHALMOLOGY IN THE EARLY PART OF THE NINETEENTH CENTURY

By BURTON CHANCE, M.D.

PHILADELPHIA, PA.

THE name of Lawrence to the surgeons of Philadelphia, in the twenties, thirties and forties of the last century, was of the greatest influence. He was one of that galaxy in England which illumined the darkness of medical thought and brought order out of the chaos of surgical practice which had existed during the reigns of the Georges, continuing more or less apparent for the first two quarters of the nineteenth century.

Prominently in that galaxy shone Sir Astley Cooper and Sir Benjamin Brodie, stars of the first magnitude. And in the same rank with Cooper and Brodie might be placed William Lawrence, yet today one rarely hears his name. It is true he never attained the public success of either of his great contemporaries, yet, so far as his mental power extended, he was their equal if he did not excel them. His labors in teaching the fundamentals of anatomy and physiology of man and animals, and the art of surgery, place him for all time among the benefactors of modern medicine; moreover, he was one of the founders of English ophthalmology and we ophthalmologists in America owe to him a great debt. His writings were read with absorbing interest both in England and America and when his treatise on the diseases of the eye was received, it served as the guide for all, at least in England, who were seeking to nourish the budding science of ophthalmology and raise it to the height of exact practice.

When Dr. Posey told me of his intention to deposit with the College of Physicians of Philadelphia, through the Section on Ophthalmology, mementos of Dr. Isaac Hays and of Sir William Lawrence, he suggested it might be of service if I would present some account of Lawrence to add to the interest. He had learned somehow that the story of the life and personality of Sir William had held my admiration for many years. This unusually beautiful stippled engraving which I show you, of the not very well-known portrait of Lawrence, by Wyatt, while he was a Surgeon Extraordinary to Queen Victoria, has hung in my office for a long time, not far from one of Sir Astley Cooper.

What I would tell of Lawrence shall be, somewhat, a retrospect of the state of Medicine from 1800 to 1850, and I will use the details of his life simply as incidents in the progress of medical education in the first half of the last century. In it an effort will be made to show the results and rewards of individual endeavor in the acquisition of knowledge and performance in practical life, not excelled, if at all equalled, by ourselves with all our wealth of facilities in laboratory and hospital equipment. The stories of the lives of the teachers and practitioners of that era, those great Englishmen who were indeed our medical fathers, have burned themselves into my heart, and I here confess that I was overcome with emotion when I stood for the first time in the hall of the College of Surgeons in London, and beheld the memorials of the men of the last of the eighteenth century and the early part of the nineteenth.

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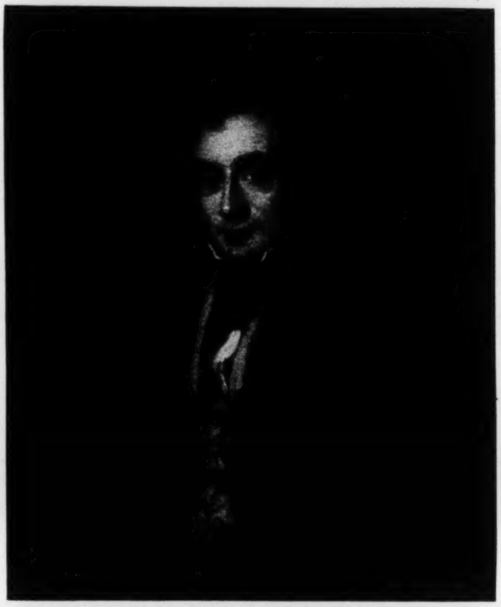
* Read at the meeting of the Section on Ophthalmology, College of Physicians, Philadelphia, Thursday, January 21, 1926.

Lawrence's career was brilliant from the days of his apprenticeship to Abernethy, and his life was centered in and about St. Bartholomew's Hospital. Abernethy, that rare genius which had arisen to startle into life the dry bones of Anatomy, received Lawrence into his house in February, 1799, when the lad was but sixteen years of age. The master was then assistant surgeon at St. Bartholomew's. At the expiration of three years, being then only twenty, Lawrence was appointed demonstrator of anatomy, a position which he held for twelve years, and, despite his youth, he was esteemed by the students as an excellent teacher of practical anatomy. In the first year of his apprenticeship he translated from the Latin, and published anonymously, Murray's (of Upsala) "A Description of the Arteries of the Human Body, arranged in the form of tables," which was the first of such tables or compendiums in English.

Abernethy is represented to us chiefly, perhaps, as a surgeon most famous for his eccentricities and rudeness of speech and manner, yet it was he who tied the carotid and the external iliac arteries. It was by his own ability that the whole condition of the surgical teaching of his age was altered. His lectures, which, by the way, he had great difficulty in making Lawrence attend, were given in a clear, simple, positive style, illustrated by an inexhaustible fund of anecdotes. He was the most popular medical teacher of the day, for his method of teaching was directed towards real knowledge and not towards what is well called cram.

It was the school at St. Bartholomew's that Lawrence entered and which he adorned as the assistant, and later the successor, of Abernethy. Might I be allowed to detail to you something of the methods by which medicine and surgery were taught at the close of the eighteenth century, and describe to you the school of St. Bartholomew's Hospital, which facts I have gathered from Mr. Norman Moore's history of that famous old hospital?

The students of medicine and surgery in Britain could not obtain much help in the practical branches at the universities, so they naturally sought such knowledge in London. Those who had not attended Oxford or Cambridge, but had been apprenticed to some surgeon or apothecary, also went to London to increase their knowledge, while London itself supplied a large body of students. The formation of so great a population of students had the arresting effect of producing a high standard of efficiency among the physicians and surgeons attached to the great hospitals, whose service was performed under constant observation of the critical eyes of the students. At first the attendance of students was regulated by the fact that some of them were pupils of particular men, but gradually medical schools were formed, and these were carried on by admirable, and constantly improving, systems of medical education. This organization owed nothing to the State, but was built up by individuals and improved by competition between separate associations of teachers attached to the chief hospitals. There were also



SIR WILLIAM LAWRENCE.

schools in some of which good teaching was done and of which the success depended on the power of one or more men of great knowledge and ability; but these had never the advantages of the schools attached to hospitals, and after a time died out.

The education of students at St. Bartholomew's, in the time of Abernethy, was altogether in the hands of the staff of the Hospital. Surgeons took a larger part in it than physicians, probably because anatomy was the preparatory subject to which the student gave most time and this naturally fell into the work of the surgeons. Anatomy and physiology were at first included in one lectureship, and when they became separated each lectureship retained the word Anatomy in its title, one being called "Descriptive and Surgical Anatomy," and the other, "General Anatomy and Physiology." Both courses were given by the surgeons. The long title of "General Anatomy and Physiology," was given to the lectureship in physiology. It was retained by the surgical side of the school.

St. Bartholomew's had long been frequented by students of three classes. First, there were physicians in actual practice, who accompanied the hospital physicians into the wards and attended the autopsies. A second group comprised graduates of Oxford and Cambridge who had proceeded, or who were intending to proceed, to hospital degrees, and who regularly frequented the hospitals. The third and most numerous group consisted of the apprentices or pupils of surgeons, of the apprentices of the apothecary, and of some apprentices from outside the hospital who obtained permission to come and follow its practice. At one period, 1820, there were only three physicians' pupils, all graduated in medicine, but there were, at the same time, hundreds of surgical students. These never entered the medical wards, but the physicians' pupils were allowed to frequent both medical and surgical wards.

The students who had taken their degrees and begun to practice increased their experience, and some made valuable observations. Bachelors or Doctors of universities, or students who were intending to take these degrees, if they proposed to practice in London, offered themselves after graduation for examination as candidates at the College of Physicians. If they wished to practice in provincial towns, they settled in the place of their choice when they had learned enough to enable them to take their degree.

The third group of students supplied the surgical staff of the hospital, as vacancies arose, and for the rest, they became surgeons, surgeon-apothecaries, or apothecaries only.

When Abernethy appeared he gave the school a reputation throughout England, and, by his course in it, improved it from a place of unsystematic instruction into a teaching institution of academic proportions and methods. He was indeed the greatest benefactor of the school.

Such was the school into which William Lawrence entered after his preliminary education at a private school at Cirencester, in Gloucestershire, the town in which he was born, July 16, 1783. His father was the chief surgeon of the town. At this period of his life he worked very hard, without interruption, a characteristic maintained throughout life. He read widely, not only of the basic subjects of medicine and surgery, but also philosophy and the classics. In 1805, when twenty-two, he received the diploma of the Royal College of Surgeons. In his twenty-sixth year he obtained the Jacksonian Prize for an essay on "Hernia." The essay became the foundation of his book on the subject, which was the standard work for many years, and went through five editions. It is written in thoroughly good English, and is remarkable for the clearness of thought as well as the mastery of the subject derived from an extraordinarily extended and accurate research.

In 1813, Lawrence was appointed assistant surgeon to St. Bartholomew's, and shortly afterward he was elected Fellow of the Royal Society. In 1814 the College of Surgeons elected him professor of anatomy and surgery, and in the same year he was appointed surgeon to the Bridewell and Bethlehem Hospitals. It is in these years that he becomes of interest to us as ophthalmologists.

For some time Lawrence had devoted a large share of his attention to the study of the diseases of the eye. Percivall Pott had in his day looked after the eye cases at St. Bartholomew's, and Lawrence took over their care when he entered on duty. In 1814 he was appointed surgeon to the London Infirmary for Diseases of the Eye, now called the Royal London Ophthalmic Hospital, popularly known to us as Moorfields. He held this position for many years; of his activities in this field I will speak later. Rather hastily, these general facts connected with his history have been reviewed in order to point out the versatility of the man and his remarkable learning and usefulness.

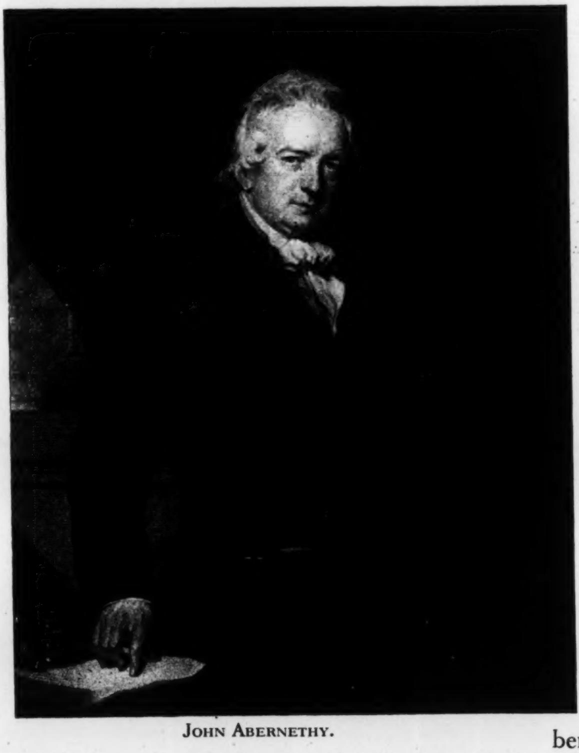
During the years of 1816, 1817 and 1818 he delivered at the College of Surgeons his famous lectures on "Comparative Anatomy, Physiology, Zoology and the Natural History of Man," which astonished so many, exciting great alarm and arousing the animosity and dread of the orthodox, lest they undermine the foundations of religion and contradict the Scriptures. Had their author been a man of less capability he would, beyond doubt, have been ruined for life. He disavowed any such attempts and withdrew the publication of his books, but the works were pirated and published without his consent. They ran thus through nine editions, the last in 1848, the sales being so large probably because of their alleged blasphemy. It may safely be said that were such a work to appear now it would evoke even in Tennessee no censure beyond that which lies within the bounds of fair scientific or literary criticism.

In 1824 he became surgeon at St. Bartholomew's, an office he held for more than forty years, and in 1829 he succeeded Abernethy as lecturer on Surgery, which office he held for thirty-three years. He was actively employed at St. Bartholomew's Hospital for sixty-five years. His became the dominating influence in the school. He was regarded by the students as the lord paramount of Surgery there. His own mental powers and Abernethy's teaching were the foundations of the professional positions to which he attained.

From this period onward he took an active share in questions of reform in medical education. In 1826 he headed a public agitation against the management of the College of Surgeons, the licensing body in those days. He made innumerable enemies, though his reputation as a surgeon and the importance of his position as a practitioner, together with his fame as a valuable contributor to medical and scientific literature, continued to bring him into recognition and power. The College, wisely "taking the bull by the horns," elected him to the Council in 1828; twice he became president; twice he delivered the Hunterian Lecture, and he served as examiner for twenty-seven years.

One of the results of his agitation was the adoption of a new charter which made an enormous improvement in the College. By the old system members of Council alone were eligible as examiners and when a vacancy occurred the senior member not on the Court of Examiners was elected almost as a matter of course. But that was a remarkable exception when the two seniors on the list were passed over to bring Lawrence into the Court somewhat before his turn.

Although usually inflexible in the maintenance of his own views, Lawrence after he became a member of the Council steadily maintained the privileges of the College against all agitators, a singular change of point for which he was criticised and condemned by many for the rest of his days. In his second Hunterian Lecture, in 1846, the opinions he expressed on certain questions which were then agitating the minds of many of the profession, and the contempt with which he spoke of certain institutions, and of ordinary surgical practitioners, called forth from all parts of the theater loud expressions of dissent and denunciation. Lawrence never for an instant wavered from his purpose, but stood his ground and by a superb feat of oratory carried his audience with him to the end, and they could not resist joining heartily in the burst of applause which greeted the close.


JOHN ABERNETHY.

At "Bart's" he was a constant attendant at the committee meetings. His influence was immense; he was seldom opposed, but almost always carried his point; his commanding presence often made men fear to oppose him. His great ability and large experience caused him to be venerated, and many instances of his personal kindnesses were known. He was regarded by Luther Holden and others of his distinguished pupils as an admirable lecturer and a first-rate teacher of surgery at the bedside. A large class usually followed him and boasted of him.

Sir James Paget, who was a pupil at St. Bartholomew's in 1834, wrote thus of Lawrence:

> His lectures were, I think, the best then given in London; admirable in their well-collected knowledge, and even more admirable in their order, their perfect clearness of language, and the quietly attractive manner in which they were delivered. As I remember them now, I feel that I did not esteem them half enough at the time. It was a great pleasure to hear them, and a good lesson. They were given on three days in the week at seven in the evening, after dinner. He used to come to the Hospital in the omnibus, and, after a few minutes in the Museum, would, as the clock struck, enter the theatre, then always full. He came with a strange vague outlook as if with uncertain sight; the expression of his eyes was always inferior to that of his other features. These were impressive, beautiful and grand—significant of vast mental power well trained and well sustained. He came in quietly and after sitting for about half a minute, as if gathering his thoughts, began, in a clear rather high note, speaking quite deliberately in faultless words as if telling judiciously that which he was just now thinking. There was no hurry, no delay, no repetition, no revision; every word had been learned by heart, and yet there was not the least sign that one word was being remembered. It was the best method of scientific speaking that I have ever heard; and there was no one, at that time, in England, if I may not say in Europe, who had more completely studied the whole principles and practice of surgery.

It can thus be seen that Lawrence was the very antithesis of Abernethy, whose manner was slouching, boisterous and racy, though his teaching was direct and accurate.

His large private practice included many cases of ophthalmic surgery. In 1833, after many years of patient observation and reflection, he produced his celebrated "Treatise on Diseases of the Eye," having previously, in 1830, published a smaller volume on "The Venereal Diseases of the Eye." A comprehensive work written with all the ability and skill which characterized his work on hernia, it may be said to have marked an epoch in ophthalmic surgery. It is the equal of any work on the subject that appeared for many years, in its accurate descriptions, and denoted the work of a pathologist and acute observer of disease. It was translated into many languages, a portion of it even into Arabic, and went through a number of editions in English, the last published in Philadelphia in 1854.

This division of his life and his ophthalmological works I will give somewhat in detail.

The "Treatise" was based on his lectures on the anatomy, physiology and diseases of the eye, which he delivered at the London Ophthalmic Infirmary from the time of his appointment in 1814. He quoted and examined the opinions and experience of others, and introduced cases for practical illustration whenever it could be done with advantage. In the introduction, Lawrence surveyed, in his usual critical temper, the state of the care of diseases of the eye as manifested in the general hospitals of his day, and then extolled the value of the special hospital, and described the London Infirmary.

Through his devotion to separate courses of lectures and by his treatises, and by his advocacy of ophthalmic hospitals, he settled for all time the question whether the ophthalmic branch ought to be extended apart from the rest of medicine and surgery. He maintained that up to his time, in general hospitals, the diseases of the eye, from the smallness of their numbers, were inadequate for the purposes of practical study, particularly that of exemplifying the various operations. These institutions, therefore, had been inefficient in reference to this important department. He declared that as the general body of surgeons did not understand diseases of the eyes, the public naturally resorted to oculists, who, seeing such cases in greater numbers, became better acquainted than the surgeons with the symptoms, diagnosis and treatment, and especially more skillful in the operative department. At the same time the subject, he continues, being imperfectly understood, was neglected in the general surgical courses, in which many affections were entirely unnoticed, and the whole very inadequately explained. Thus students who resorted to London for the completion of their professional studies had really no means of learning this important department of the profession, which was tacitly abandoned, even by the hospital surgeons, and turned over to the oculists. The latter, not being conversant with the principals derived from anatomy, physiology and general pathology, attended merely to the organ, and relied almost exclusively on what is comparatively of little importance, the local treatment. At the opening of the century ophthalmic surgery, being in a manner dismembered from the general science, was, in England at least, reduced to so low a status as to be in almost total darkness.

In consequence of this state of things it became desirable to establish an "express and distinct school," for ophthalmic surgery; not because the principles of treatment differed from those applicable to disease in general nor because any peculiar mode of study was required, but in order to supply a deficiency in the existing sources of professional instruction, to provide for the diseases of this important organ those means of information which the general hospitals, consistently with the requisite attention to their other important objects, neither did nor could provide. At first view this procedure seemed calculated to complete and perpetuate the separation, yet it became the only rational mode of re-uniting ophthalmic practice to general surgery.

The object of the London Ophthalmic Infirmary was to apply the general principles of pathology and therapeutics to the elucidation and treatment of diseases of the eye; hence it became the law that the medical officers of the institution should be selected from those who had been regularly educated as physicians and surgeons. The great field of observation which the Infirmary afforded was thrown open to the public, which enabled the general body of the profession, and particularly medical students, to acquire easily and in a short time a full knowledge of ocular disease. It was not the intention of this institution to make "oculists," but rather to impart to surgeons and physicians a knowledge of ophthalmic disease.

Lawrence met the doubt expressed whether the affections of the eyes afforded matter for a separate course of lectures or treatise. Listen to his pleading (and I would remind you that at this time practically nothing was known of the microscopic structure of the eye):

> The eye although small in bulk is complicated in structure, being made up of several distinct or dissimilar tissues, and it exhibits all the affections to which each of these is liable. Although its component structures are for the most part analogous to what we meet with in other parts of the body, and consequently must be subject to morbid affections essentially similar to those occurring elsewhere, yet the office and form of the organ, the union of its component parts, and the nature of many of them, are so peculiar, as to give a strong character of individuality to its diseases. We do not, at the first view, recognise in affections of the eye the same diseased processes with which we are familiar in other parts; we seem to be contemplating something peculiar and individual, and this more especially in the diseases of the peculiar tissues. This individual and distinct character of ophthalmic diseases both accounts for their having been detached and considered as a separate branch of surgery, and in conjunction with their number, justifies the appropriating to them distinct courses of lectures and treatises.

He advocated the dissemination of knowledge concerning the normal healthy eye as a means of understanding and curing the affections of the diseased eye, and expressed himself in terms which might seem trite to us in these days, but he made such observations twenty years before the ophthalmoscope was invented:

> A considerable portion of the organ is external and the transparency of the front enables us to see much of its interior. We can observe the phenomena of disease, and the effect of remedies in some of its internal structures, in such parts as are elsewhere hidden from our view. The observations thus made on the eye are applicable to the illustration of disease and treatment in other organs. Hence if the general principles of medical science throw light on ophthalmic affections, the history and progress of the latter reciprocally afford valuable data for general pathology.
>
> Hence, in order to understand any part of the body, one must know the whole; and this holds equally good in diseases as in health. Suppose a person complains of weak sight, we shall not be able to remedy the defect if we attend to the eye only, for probably there may be no visible alteration in the organ. We must look to the state of the circulation in the head, to the condition of the digestive organs; we must inquire into the patient's habits, into his diet, into his general mode of living, as well as into the causes which may be acting on the eye. Until this analysis has been made, we cannot know the causes of the disease, nor can we arrive at clear grounds of treatment. We ultimately find that the eye must be cured, not by any direct or local measures, but by those of general influence; by loss of blood, purging, change of diet and of other habits.

Need I remind you that such doctrine was enunciated a hundred years ago? Yet we must transport ourselves back to his day to sympathize with him who had no knowledge of the activities of microörganisms and the methods of their elimination.

He continues:

> In such a system, then, of intricate connection and mutual influence, each part will be best understood by him who has the clearest notions of the general economy. Even the practical

> treatment is most judiciously conducted by those who are in the habit of treating disease generally; who do not confine their attention to the part. This confinement is prejudicial, by producing and confirming habits of partial and narrow views, by leading to neglect of mutual relations and influence, by encouraging local treatment. Exclusive attention to a small corner of the animal structure causes a confinement of mental vision, analogous to the nearsightedness which mechanics contract by constantly poring over the minute objects of their attention. All the habits of the "oculist" lead to a separation and insulation of the organ. The part is detached from the system, treated by washes, drops, ointments, and this inefficient trifling impedes the progress of ophthalmic surgery. We want, instead of this, general and comprehensive views, the aid of analogy and contrast; the whole field of medicine and surgery must be laid under contribution for the principles which are to guide us in learning the nature and treatment of ophthalmic disease. Professed oculists have done little for the science, either here or abroad. The only real and valuable improvements have proceeded from men of extensive anatomical knowledge, and of great general insight into disease.
>
> A question has been raised whether a minute knowledge of anatomy is necessary to surgeons? and pains have been taken to show that it is not. . . . I cannot think of calculating with how small a stock of scientific knowledge it might be possible to carry on the trade of surgery. What kind of feelings, what conscience can the man possess, who can plunge an instrument into the human body without knowing what he may divide or injure? who can operate without that full anatomical knowledge that will enable him to meet every emergency? How could he bear his own reflections, if he should see a patient seriously and permanently injured in consequence of his ignorance and rashness? At all events, minute anatomical knowledge is necessary to an acquaintance with diseases of the eye, especially in the important subject of diagnosis, and in operations.

In reviewing the history of medicine he states that as a separate form of practice oculists were coeval, perhaps, with Medicine itself. The Egyptian had a physician for each class of disease. The Greeks and Romans had their oculists, as can be shown by the inscriptions on marbles and seals still preserved, and it may be believed that oculists were as numerous in ancient Rome as in any modern city. Up to the latter half of the eighteenth century, the management of the diseases of the eye was left to quacks, to mountebanks and itinerant practitioners; there were many of them, both in England and on the Continent.

He then tells of the establishment and conduct of schools and hospitals on the Continent devoted to ophthalmology. In his opinion:

> The most important era in the history of ophthalmic surgery is the establishment of the Vienna school of ophthalmology. The Austrians have not only the honour of having instituted the first public establishment expressly appropriated to the advancement of this hitherto neglected branch of the profession, but of having preceded all the rest of Europe by many years.

He alludes to the appointment of Joseph Barth as lecturer on ophthalmic surgery in the University of Vienna in 1773.

He then refers to the works of those who contributed to the advance of ophthalmology, to their published writings, and to the launching of the first periodical journals devoted to this subject. It was not until Monteath of Glasgow translated Weller's "Compendium," of 1826, that there was obtainable a practical systematic handbook for the practitioner in England.

The London Ophthalmic Infirmary was established in 1804, but not thrown open to students for the purposes of observation and instruction till 1810. It was at this institution that the first impulse was given to the scientific study of ophthalmic medicine and surgery in England. Mr. Saunders, who founded it in conjunction with Dr. Farre, had received a regular education in anatomy and surgery at St. Thomas' and Guy's Hospitals. Lawrence states that we are indebted to him for the important improvement of operating for cataract in infants; and his instructive posthumous observations, edited by his friend and colleague, leave no doubt that, if his life had been spared, he would have done much more for the improvement of the science.

Dr. Farre, at the Infirmary, set the example of applying the general principles of pathology and therapeutics to the elucidation and treatment of ophthalmic diseases. In the clinical illustration of cases, the exposition of curative indications, and simplicity of treatment, he could not be surpassed, in Lawrence's judgment. Lawrence reminded all "who had had the advantage of Farre's instructions to remember them with gratitude and respect; and all would regret that he had not communicated to the public, through the press, the interesting results of his long practice, his close observation, and mature reflection."

The example of the Vienna ophthalmic schools was followed in most of the large towns of Germany, while that of the London Ophthalmic Infirmary led to the formation of similar institutions in many parts of England, Scotland and Ireland, so that before 1835 ample opportunities existed for the relief and study of ophthalmic disease. The editor of the American edition of Lawrence's treatise, Dr. Isaac Hays, was one of the four surgeons who inaugurated the surgical service at Wills Hospital for the Indigent Blind and Lame in Philadelphia, in 1834.

Lawrence was president of the Medical and Chirurgical Society in 1831, and contributed a number of papers to its *Transactions.* He published many essays and observations in the *Lancet* and other journals. He wrote more than any surgeon who had preceded him at St. Bartholomew's. His lectures on surgery he did not publish until 1863. Alas, only when they were out of date! They were a good summary of the best practical authors of his earlier days. He had laid, after some years of hard study and constant clinical obervation, a most solid and extensive foundation of surgical knowledge, quite sufficient for practice and far beyond that of most ordinary men. Fifty years ago surgeons spoke of his works on hernia and on the eye as those that give the best idea of his professional ability. The public recognized it and he was frequently consulted.

Great was Sir William Lawrence's usefulness; he lectured, and wrote and spoke, each in a manner equalled by few, and in all together próbably surpassed by none. It was admitted by those most competent to judge that he wrote well, that his style was excellent, correct, perspicuous and graceful. But, again, they acknowledged that he was greater as a lecturer than as a writer, and those who had had the best opportunity of judging agreed that he was greater in ordinary conversation than in public speaking. The student who diligently attended his practice saw a man of the highest abilities, of knowledge, of the utmost accuracy, and never-failing readiness, punctually attending to his duties in a large hospital to whose patients he afforded that care and relief which laborious education and long experience with coolness in the boldest, and delicacy in the most minute, operations alone could convey.

At the death of Sir Benjamin Brodie, he was appointed sergeant-surgeon to Queen Victoria in 1857, and, in 1867, a baronetcy was conferred upon him.

Lawrence was in active service at St. Bartholomew's Hospital till he was past eighty years of age, "still performing his duties, with little less vigour than when he was first attached to that school more than half a century ago." He resigned the office of surgeon in 1865, but continued to act as examiner at the College of Surgeons till May 11, 1867, when he was seized with paralysis of the right side while walking upstairs to examine.

He was taken home to bed and was visited by Sir Thomas Watson, who saw that he wished to ask for something, but, while his looks showed perfect intelligence, he was incapable of articulate speech. He was given some loose letters out of a child's spelling box, and laid down the four, B D C K. He shook his head and took up a pen and when a drop of ink fell on the paper, he nodded and pointed to it. "You want some 'black drop,'" said his physician, and this proved to be what he had tried to express.

He died July 5, 1867, at 18 Whitehall Place, the house in which he lived for many years. He had nearly completed his eighty-fourth year. His earlier residences were in John Street, Adelphi (from 1807), and soon afterwards within the buildings belonging to the College of Physicians in Warwick Lane, London, whence some of his prefaces are dated. He had a beautiful country house at Ealing. His wife died before him; he left two daughters and one son who founded a scholarship in Pathology and medal in his memory in 1873, which was in 1910 increased by his daughter to the annual value of £115.

The son, Trevor, who succeeded to his father's title, studied at St. Bartholomew's and later served as treasurer of that hospital, and at the present time a grandson, Sir William, is one of the active governors.

Throughout his long life he enjoyed almost uninterrupted health; within not many months of his death he declared that he had never been kept from his duties by illness for a week together. No man could be less self indulgent than he, no one was ever more orderly in his work or more punctual to his engagements.

He was, later in life, at least, a remarkably handsome man. Above the ordinary height, elegant in form with a strikingly fine head and face, a magnificent forehead, a clear blue eye, a mouth ample, but with thin lips and singularly expressive. He had been myopic since his early years.

Sir William Savory, one of his devoted students, wrote:

> The distinguished presence of Lawrence as he moved amongst us, a model of intellectual beauty, is not likely soon to be forgotten. He had a natural grace and dignity of bearing which never failed to impress every one. His bearing to the sick poor was absolutely faultless. Always kind and considerate, no one was ever more gracious to women and children. It was delightful to watch his kindnesses to them and it is pleasant to recall it.
>
> His example will survive and influence surgery long after those have passed away who can now remember the fine old gentleman as he went round the wards of St. Bartholomew's.

It was said by a distinguished person who commented upon his life and works that "such was the veneration he had received for Lawrence from his father, a surgeon at St. Bartholomew's, that he felt proud to remember that he himself had once seen Lawrence walk across the square of the Hospital."

He had many enemies and by them he was hated as roundly as he was beloved by his adoring friends. The animosity which he excited rested not upon his course as teacher and practitioner but upon his influence over medical politics, which continued undiminished as long as he lived. It was predicted at the end of his life, that the time would come when Lawrence would be ranked, by those who had never known him, below men who in almost every respect were inferior to him.

Nevertheless, the name of Lawrence must ever be amongst the foremost of those who have adorned the annals of surgery, and, although there has existed much difference of opinion on the exact place to which he should be assigned amongst men who have achieved greatness, his fame has not rested upon any single brilliant discovery, but upon the record of his whole work.

STUDIES IN PALEOPATHOLOGY XVII:*

AN ALVEOLAR ABSCESS IN THE MANDIBLE OF AN EXTINCT MAMMAL

By ROY L. MOODIE, PH.D.

CHICAGO, ILLINOIS

Dental Diseases

SO little is known of stomatological difficulties in fossil vertebrates that every effort should be made to place on record the details of such lesions as come under observation. Many types of dental disease are very rare. I have examined thousands of teeth of fossil mammals but have not yet seen a single case of fossil dental caries. Yet such things have been seen by other investigators and I have discussed and listed their findings in Chapter VI of my book, "Paleopathology," under the heading "Caries and Alveolar Osteitis among Fossil Vertebrates." Other types of oral disease are more abundant, but no definite, extensive study of fossil dental pathology has been made. Plans for such work are now definitely under way and will, I hope, yield valuable results. A careful study of the ancient conditions under which dental disturbances arose will be of benefit to those working on more recent materials.

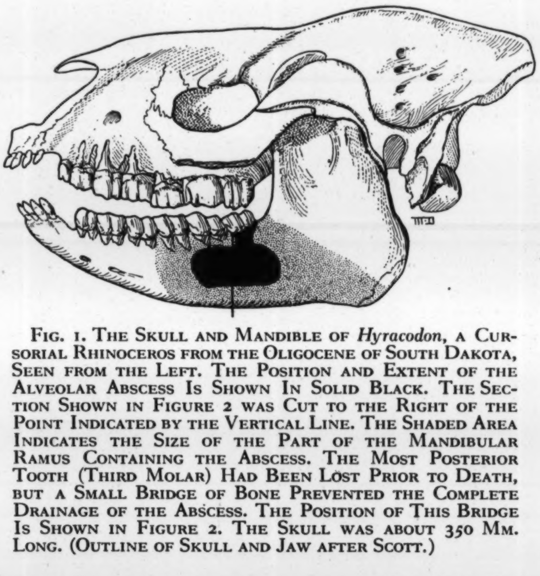


Fig. 1. The Skull and Mandible of *Hyracodon*, a Cursorial Rhinoceros from the Oligocene of South Dakota, Seen from the Left. The Position and Extent of the Alveolar Abscess Is Shown In Solid Black. The Section Shown in Figure 2 was Cut to the Right of the Point Indicated by the Vertical Line. The Shaded Area Indicates the Size of the Part of the Mandibular Ramus Containing the Abscess. The Most Posterior Tooth (Third Molar) Had Been Lost Prior to Death, but a Small Bridge of Bone Prevented the Complete Drainage of the Abscess. The Position of This Bridge Is Shown in Figure 2. The Skull was about 350 Mm. Long. (Outline of Skull and Jaw after Scott.)

Material

An incomplete mandible (Fig. 1) of an extinct mammal, evidently pathological, was given me by Dr. Romer of the University of Chicago. The portion of the mandible preserved was made rugose by the presence of numerous low, blunt osteophytes, indicating the presence during life of infection of long standing. Suspecting that these pathological growths might be due to an alveolar abscess, a section of bone was made at an indicated point and a cavity, evidently due to infection, was disclosed. The cavity is, of course, filled with rock at the present time, but the texture of the rock and its differentiation from the hypertrophied and osteosclerotic bone is clear. Cut sections, gross and microscopic, of the parts showed a case of an alveolar abscess, the oldest example of this type of disturbance so far known. The specimen seems to represent *Hyracodon*, a rhinoceros belonging to a group of cursorial or running mammals which have been extinct for millions of years. They were quite different from the modern stubby-legged, near-sighted, clumsy beast at present living in remote places in Africa and southeastern Asia. The ancient rhinoceroses were tall, slender-limbed animals, apparently capable of attaining speed enough to escape the carnivorous animals of their day. Giant, running cats, with unusually long teeth, wild dogs of large size and wolf-like animals were its enemies. Its only safety lay in its speed. The rhinoceros remains occur abundantly in the White River Beds (Oligocene) of the western states.

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* Owing to an inadvertence the serial numbers of the first three Studies appearing in Volume VIII, No. 1, were changed. They should read XIV, XV, XVI, instead of Second Series I, II, III.

ABSCESS

The relations of the abscess to the alveolus are clearly shown in Figure 2. The diagram in Figure 1 is only an approximation of the size and shape of the cavity based on a study of sections cut from the fragmentary jaw. The evidence seems to show that the molar overlying the abscess was lost before death, and the alveolar margins are rounded as if absorption had set in. The socket is enlarged and abnormal. The roughening of the surface of the mandible, where there are low osteophytes, indicates an overflow of pus for an extensive period of time. Under these circumstances it is difficult to understand why the pus pocket in the canal had not been completely drained. But there had been some obstruction, such as a bridge of bone, which had retarded drainage. There are no indications of healing in the walls of the abscess cavity.

FOSSIL MAMMALS EXAMINED

When it was observed that the abscess had penetrated to the mandibular canal, efforts were made to determine the relations of the normal mandibular canal in related fossil mammals and other fossil species. I am indebted to Dr. R. S. Bassler and Dr. J. W. Gidley of the United States National Museum for an opportunity to study thin sections from the jaws, and the jaws themselves, of the following species: (1) A fossil ungulate, condylarthra, Paleocene, Fort Union Beds; (2) An Eocene primate; (3) An artiodactyl, Oreodon, Oligocene; (4) Perissodactyl, Hyracodon, Oligocene; (5) Rodent, Ischryomys, Oligocene; (6) Carnivore (bear), Pleistocene; (7) Euplatygonus, a Pleistocene (Suidae) peccary; (8) Horse, Perissodactyl, Oligocene.

Additional material consisting of fragmentary mandibles of *Diceratherium* was sent by Mr. Harold Cook of Agate, Nebraska, and Professor Mannhardt of New York University sent further specimens of *Hyracodon* jaws. With all this material as a check I felt confident to go ahead with the study of the fossil alveolar abscess.

The normal, anatomical relations are discussed in a forth-coming paper, with the title: "The Mandibular Canal of *Diceratherium*."

SPICULES

The spicules of bone, seen in the light-colored bars within the black area of Figure 3*c*, are indicative of a rapid destruction by erosion of the wall of the mandibular canal. It is quite probable that the aggregation of these spicules near the alveolus delayed or prevented adequate drainage. The canal itself is greatly enlarged and its walls sclerotic, with spicules being cast off here and there. The posterior limit of the abscess cavity was nearer the socket of M3 than the anterior limit. It is to be noted

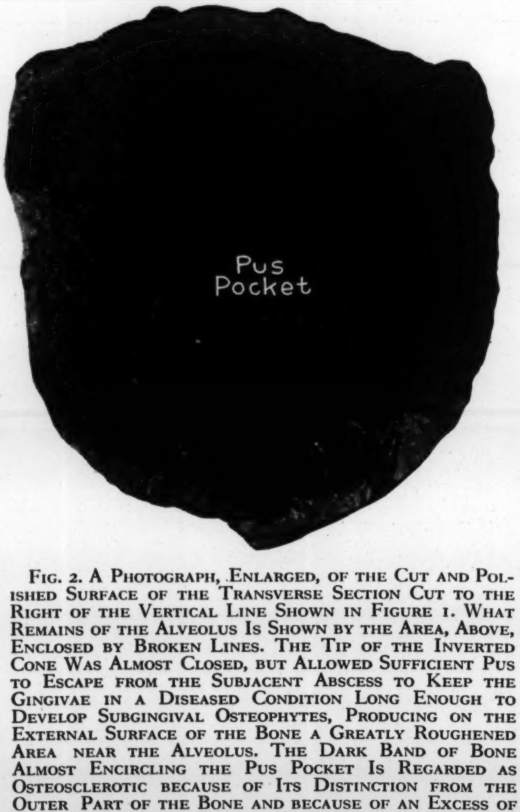

Fig. 2. A Photograph, Enlarged, of the Cut and Polished Surface of the Transverse Section Cut to the Right of the Vertical Line Shown in Figure 1. What Remains of the Alveolus Is Shown by the Area, Above, Enclosed by Broken Lines. The Tip of the Inverted Cone Was Almost Closed, but Allowed Sufficient Pus to Escape from the Subjacent Abscess to Keep the Gingivae in a Diseased Condition Long Enough to Develop Subgingival Osteophytes, Producing on the External Surface of the Bone a Greatly Roughened Area near the Alveolus. The Dark Band of Bone Almost Encircling the Pus Pocket Is Regarded as Osteosclerotic because of Its Distinction from the Outer Part of the Bone and because of an Excess of Calcium Shown in Figure 4*b*. In Figure 3*c* Several Spicules of Bone Are Seen in the Pus Pocket.

that the mandibular canal ascends abruptly in this region, to end at the nearby mandibular foramen.

Histology

The photomicrographs (Fig. 4 *a*, *b*, *c*, *d*) show the histological structure of the normal (*a*) and the pathological (*d*) bone. The striking differences in the aspect of *a* and *d* are attributed entirely to the influence of the infection. The material shown in *a* was taken from the lower, outer surface of the section shown in Figure 2, while the bone represented in *d* was derived from the wall of the abscess cavity. This bone shows evidences of sclerosis in the more abundant osseous matrix, emphasized in Figure 4*b*.

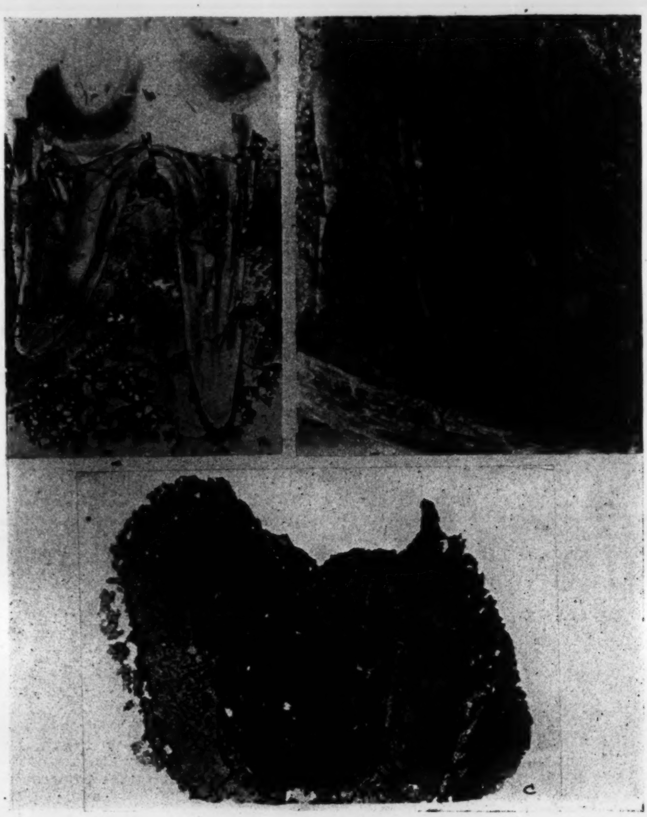

Fig. 3. Enlarged Photographs of Portions of Area Occupied by the Abscess in the Mandible of the Fossil Mammal.

a. Roots of Teeth in the Mandible of the Extinct Mammal, Outside of the Limits of the Abscess. The Alveolar Bone Is Greatly Fractured and the Region Is Enlarged by the Mechanical Intrusion of Crystalline Material. This Condition has Nothing to do with Disease. A Discussion of Minute Fragmentation of Fossilized Bone Will Appear Soon in the *American Naturalist* under the Title "A Cretaceous Fish Spine." (×10.)

b. Roots of Teeth Adjacent to the Abscess and Showing the Effects of Erosion on the Alveolar Bone. The Dark Area, Outlined, Is the Pus Cavity of the Abscess Which Has Produced a Well-defined Erosion. I Was Not Certain That This Type of Cavity Might Not Be the Normal Condition of the Mandibular Canal in Fossil Mammals. An Examination of the Normal Jaws of Several Species of Tertiary Mammals Showed Me That the Present Condition Was Undoubtedly Pathological; the Details of This Examination Are Given in the Text. This Figure Was Obtained from a Median Vertical Section of the Anterior Portion of the Jaw. The Light Band at the Bottom is the External Part of the Mandible. (×10.)

c. An Enlarged Photograph of a Thin Section of the Material Filling the Pus Pocket and the Surrounding Bone. A Number of Bone Spicules are Evident in the Light Bars Scattered throughout the Pus Pocket, Indicating Disruption of the Bone. The Bridge of Bone, Restraining the Pus, Was Broken Off in the Preparation of the Section.

There is no indication that the activity of the infection had diminished at the time of death, nor are we justified in assuming that this abscess played any vital part in the animal's life save that of lowered resistance.

Résumé

The only known fossil alveolar abscess is described in the left mandibular ramus of an extinct rhinoceros, *Hyracodon*. The abscess had penetrated the mandibular canal and was quite extensive as shown by the eroded areas at the roots of the teeth. The destructive effect of the infection is evident in the cast-off spicules of bone. Osteosclerosis was also induced by the pathological processes going on within the body of the jaw.

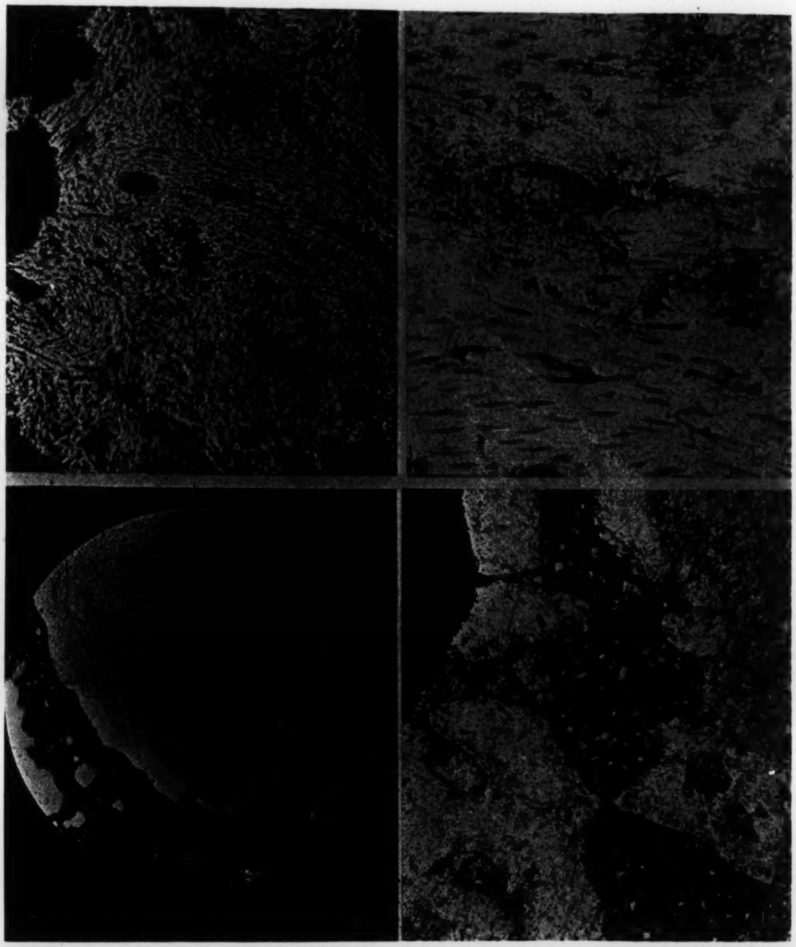

Fig. 4. Photomicrographs of Various Areas Adjacent to the Abscess, Showing Histological Features of the Normal and Pathological Bone.

a. A Section Was Made from the Outer Band of Bone, Shown in Figure 2 at the Ventral Margin. This Tissue Was Unaffected by Disease and Shows the Structure, i.e., the Lacunae, Lamellae, Perforating Fibers, etc. (×100.)

b. Osteosclerotic Bone from the Margin of the Pus Cavity, with Portions of Four Vascular Cavities. The Lacunae are Large and Spindle-shaped, with Wide Areas between Them. (×200.)

c. Tip of Root of Tooth of *Hyracodon*, Shown to the Right in Figure 3*a*. This Was Unaffected by Disease. The Dark Material is Intruded Matrix. (×25.)

d. Some of the Loose Fragments of Bone Shown in the Upper Portion of the Pus Pocket in Figure 3*c*. They Are Regarded as Osteosclerotic. They Certainly Differ in Appearance from the Normal Bone Shown in *a*. The Dark Intruded Material is Matrix with Which the Cavity Was Filled. (×50.)

THE HISTORY OF HERPES FROM THE EARLIEST TIMES TO THE NINETEENTH CENTURY

WITH REMARKS ON DERMATOLOGICAL LESIONS IN GENERAL

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THE Hippocratic Collection contains little relating to cutaneous pathology. It is to be recalled, however, that baths were frequent and therefore had a prophylactic action in warding off diseases of the skin. In the Hippocratic Collection there is certainly question of herpes, but the writer merely alludes to this lesion. He attributes lepra to phlegm and melitagra is described, because he says that "the cracks in the skin give rise to a secretion similar to honey."[1]

The little said of herpes in the Hippocratic Collection is, perhaps, not on account of its infrequency, but rather because the ancient physicians looked upon skin lesions as deformities and not diseases. However this may be, the term "herpes" was employed in the earliest epoch of Greek medicine to designate chronic cutaneous affections, and I shall show that Galen likewise used it with great discretion.

Following upon the epoch of Hippocrates comes the brilliant school of Alexandria. Of its great masters only fragments of the writings have come down to us in the works of Galen, Oribasius, Aëtius and Alexander of Tralles. Celsus, who lived during the reign of Augustus in the brightest days of Rome, has left us some very remarkable passages on herpetic skin lesions. In his article, "De Papulio," he evidently is referring to herpes, and some of his phrases are quite excellent descriptions of this morbid process. By calling herpes "papulae" Celsus is right, because certain herpetic patches are merely extensive areas of papules. In the following quotation he evidently gives a good description of tinea imbricata: "The skin is unequal . . . the middle of the lesion is a little smoother than its contour." He then adds the following remark: "Tarde serpit: idque vitium maxime rotundum incipit, eademque ratione in orbem procedit," and in these few words he gives a picture of the disease. The herpetic phenomena were no secret to this writer, for he refers to another type of herpes which I am led to suppose was a scaly form of the lesion, the Aγριαν of the Greeks. Celsus also says: "nisi sublata est, in impetiginem vertitur," which still further confirms my opinion, because Celsus describes squamous herpes, as I shall show, by the name of *impetigo.*[2] Under the title of *impetiginibus speciebus,* Celsus certainly describes eczema madidans, an arthritic process, in its various phases, because in the first phase he speaks of red areas of the skin with small pustules resembling bullae which became detached in the form of scales, "quasi squamulae solvuntur." The second type (or phase) is more serious and similar to herpes: "fere simile papulae," but the shape of the lesion differs from one case to another, while the skin is deeper red. A large quantity of fine scales falls; the erosions are considerable in extent and extend in surface. In the third type the skin is indurated, denser and more swollen; the epidermis is tense, the erosions more extensive and the lesion covered by scales. The fourth type presents whitish scales similar in aspect to lentil leaves. When these scales drop off, blood may exude from the skin, but usually the secretion is a white serum. "Squamulasque habet pallidas, quasdam subabalbidas . . . profuit sanguis nonnumquam alioqui humor ejus albidus est, cutis dura atque fissa est, proceditque latius."[3] As is seen, each particular phenomenon is described and nothing is overlooked. It is clear that Celsus is giving us a clinical picture of eczema madidans.

In his chapter: "De varis, lenticulis et ephelide," Celsus is unquestionably treating the subject of acne. He remarks that it is almost folly to attempt to treat this cutaneous morbid process: "Pene ineptiae sunt curare varos, etc."[4] If Lorry's opinion be accepted, Celsus designates erysipelas by the term *ignis sacer*, but personally I am of the opinion that he refers to herpes zoster, which he confused with certain types of ecthyma: "Fit maxime in pectore, aut lateribus, aut eminentibus partibus."[5]

Under the name of *sicosis*, Celsus describes a circular deep ulcer of the chin. He thus imitates the Greeks, who termed it συχωσις,[6] but it is clear that this ulcer was not mentagra as Willan erroneously maintains. For that matter this passage from Celsus is quite sufficient to show that it in no way relates to mentagra, and furthermore, it is an historical fact that mentagra was unknown at Rome until the reign of Tiberius (37 A.D.), therefore at least seventy years later than Celsus. Pliny[7] tells us that this disease was brought from Egypt, where it was endemic, by a Roman noble, a native of Perugia, after a sojourn in Asia. He likewise states that it was during the reigns of Tiberius and Claudius that mentagra ravaged the Roman people. It was under the latter emperor that Pamphilus, mentioned by Galen, concocted his famous vesicatory plaster for the cure of this affection.[8] It would even seem (Peyrilhe at least would have it) that the edict of Tiberius against kissing at ceremonies was merely a prophylactic measure to prevent the spread of mentagra.[9] When speaking of *therioma* (the Greek for a malignant ulcer or tumor), Celsus refers to esthiomenus, which at present is held to be a superficial tuberculous process of the genitalia, as similar to cancer. He states that it extends through the tissues to the bone, that it is irregular in outline, giving issue to a gelatinous humor and spreading a fearful stench. He adds that the Greeks called this ulcer Hερπης εισισμηνον.[10]

Much of interest might be said of what Celsus has to say of acrochordon, alphos and melasma, but space forbids. His chapter on porrigo is really admirable. From what has been said, it is clear that Celsus was thoroughly familiar with the clinical types of herpes and eczemas, but he had given up the term herpes employed by the Greeks.

Galen revived the term herpes and gave it a correct application. According to him herpes does not necessarily imply an ulcerating lesion; the processes extend from one part to another in a serpiginous way, for he says: "Herpes non semper ulcus est, quotiesque cum ulceratione est, non utique servata veteri sede, vicinas partes depascit, sed sicuti nomen ipsum indicat, ritu serpentis bestiale relicto priore loco transit ad alterum."[11]

Galen admits three types of herpes that he supposes take their origin in the yellow bile. The first is herpes esthiomenus (ερπης εφισμενσς, seu erodens), which is a common lesion; his second type, herpes miliaris, can only be what the later dermatologists defined as an eczema with soft honey-like crusts, namely eczema madidans, at least if one accepts the opinion of Roussel, Plenck and other writers of the eighteenth century, and I am quite inclined to suspect that they simply imitated Galen. And lastly, the third type seems to comprise several forms of herpes involving large areas of the cutaneous surface but which are rather difficult to determine exactly.[12]

In his "Methodus medendi," Galen again refers to herpes and gives some active therapeutical measures employed by A. Musa, Pasion and others.

The writers after Galen give most confused descriptions and offer nothing original. As to herpes, Oribasius merely copies the physician of Pergamos; he speaks of herpes excedens and herpes miliaris and briefly mentions the exanthemata, of "pustulis quae phlyctenae nominantur, de epinyctidibus"; but what he says is a sure proof that the Greeks did not confuse herpes and eczema with the eruptive affections of the skin.[13] In his Chapter xxvii, it will be seen that the Greek physicians were more familiar with the eczematous processes than with those which, like herpes, are chronic.

Aëtius very frequently copies Galen, as is pointed out by Peyrilhe, and in his chapter, "De herpete," makes the same distinctions as the physician of Pergamos.[14] However, Aetius gives some little attention to what is clearly moist eczema of the scrotum and stresses the tenacious character of the process and the excoriations and crusts which occur: "Humores . . . acriores autem ipsam exulcerant . . . . . squamae generant et pruritum inducunt."[15]

Among an enormous number of useless formulae one finds a few sentences referring to cutaneous affections that are not without value; for example: "ad pustulas psydraces graecis appellatas, et ad papulas ex fervore aut sudor abortus"; it is evident that our author is dealing with certain acute processes undergoing a rapid evolution. Aëtius expresses himself, at the beginning of this chapter, as follows: "Fiunt in toto corpore pustulae, dolorem inducentes citra saniei collectionem, eas eczemata, ab ebulliente fevore, Graeci vulgo appellant."[16] Although it is clear that Aëtius does not specify anything in particular, one may be permitted to connect these generic characters with acute pemphigus, ecthyma, and, perhaps, even herpes zoster. If I am not wrong in my induction, if it be true that the Greeks comprised under the name of eczemata this group of cutaneous affections, it may truly be said that there is nothing new under the sun.

Aëtius also gives a description of leprosy borrowed from Archigenes, with remarks on its differential diagnosis, and as he includes herpes among the affections to be differentiated from this disease I will quote him: "Differt autem lepra ab impetigine sylvestri, eo quod impetigo orbiculatim semper ad vicinos locos proserpit." By *impetigo* is meant herpes circinatus, at least that is my interpretation, because nearly all writers who followed Archigenes have never put forward any other interpretation.

Alexander of Tralles says nothing of herpetic skin affections, but he describes various forms of tinea at some length in his chapters, "De porrigine," "De achore" and "De favo."

Paulus Aegineta confuses, as did Aëtius, a number of herpetic skin manifestations under the name of *scabies*, but he shows that leprosy is different from these affections for he says: "Verum lepra per perfunditatem corporum cutem despascitur orbiculatione modo, una cum hoc quod squamosa piscium squamis similes dimittit. Scabies autem magis in superficie haeret et varie figurata est, et furfuracea corpuscula remittit."[17]

This passage is important and Paulus by stressing the depth of the ulcer and the type of scales makes a very happy differential diagnosis. It also shows that the ancient physicians did not confuse scales with furfur. These pathological productions clearly served them as differential signs.

In the following chapter Paulus speaks of impetigo but unfortunately offers theories of little import and in reality describes nothing distinctly. The same cannot be said of his Chapter iv, in which he describes prurigo of elderly people with great exactness. Chapters viii, ix and x, entitled "De pustulis," "De pustulis nocturnis" and "De papulis sive bullis" are most curious and reveal the infancy of dermatology. The ancient physicians were quite unable to explain complex phenomena and only took into consideration those morbid accidents which were obvious and perceptible. Paulus includes certain subcutaneous purulent collections among pustules and advises their incision: "Per cutem avecuare oportet et non procul distrahere."

Paulus is very inexact in his description of herpes and completely altered Galen's views on the subject. However, he admitted that simple inflammation of the skin was slightly different from the disease in question, because he supposes that blood "bonus et crassitie moderatus" gives rise to erysipelas, while yellow bile produces herpetic processes (Chap. XVII). Although Paulus loses himself in unprofitable theories in Chapter XX, in which he speaks of the treatment of these affections, he designates them by the term of *herpes vehementer depascentes*, and like Galen recognizes herpes miliaris and, by *herpes adedens*, that which destroys the integument down to the subcutaneous tissue.

Coming now to the Islamic physicians, I would say that the writings of Rhazes will not be referred to because in Avicenna will be found about all that the former illustrious physician has to say in respect of dermatological pathology.

Avicenna (980–1036 A.D.) was born in the province of Khorazan and although an extensive writer on medicine what he has to say of skin diseases is far from clear. He changed the word herpes to that of *formica*, of which he describes two types, viz: a corrosive and a miliary. He gives the reason for his preference to the term *formica* when he says: "Sentitur in omni formica sicut punctura formicae." Whatever may be thought of this figurative description, Avicenna was well aware of the true character of the affection, because he says that it is composed of an aggregation of pustules which extends in surface, ulcerates or sometimes subsides: "Formica est pustula aut pustulae, quae egrediuntur, et faciunt accidere aposthema, et ambulant: et fortasse ulcerant: et fortasse resolvuntur."[18]

It is evident, I fancy, that Avicenna misunderstood the pathology of esthiomenus, and regardless of the teachings of the Greek physicians and Celsus, he looked upon it as a kind of necrotic process. Some writers of the Middle Ages, among others Guy de Chauliac, followed Avicenna's teachings in this respect, which resulted in great confusion.

In Chapter XIII, entitled "De Essere," Avicenna seems to describe eczema madidans; he speaks of *pustules sicut vesical*, of bright redness of the skin accompanied by pruritus. He speaks of the moist state of the lesions and occasionally the presence of a blood-tinged secretion. And lastly, I would point out that Avicenna seems to have confused several arthritic skin manifestations in his chapter on "Scabies et pruritus." He retains the term of impetigo but in respect of this morbid process he theorizes to such an extent that one is lost in a maze.

Gulielmus de Saliceto, who flourished in the thirteenth century, was professor at Verona. In his work on surgery are to be found several chapters devoted to diseases of the skin which are decidedly noteworthy. He refers in detail to certain types of tinea and makes some important remarks on eczema of the scalp in nurslings. From Chapter LIII of the first treatise of "dirty crusts on the thighs," and from the description, I infer that the writer is considering a dartrous process of the skin. But in Chapter LVII he speaks of *herpes esthiomenos* and says that "it appears like a pea with induration of the surrounding parts and heat and that it increases and progressively extends by multiplying. . . . It continues to extend corroding the parts until they are destroyed," and so forth. The clinical picture here given by Saliceto is, I believe, clearly that of lupus and is the first recorded in the history of medicine.

Further on, de Saliceto copies Avicenna by employing the word *formis* in place of the Greek herpes, and in the same chapter he also describes impetigo: "The [clinical] signs of formis and impetigo are pruritus and heat of the parts affected with roughness of the skin and shedding of scales. . . . Formis differs from impetigo. It is less severe than the latter, the roughness [of the skin] is less, likewise the extent of the lesion." Clearly our author is describing herpetic cutaneous processes.

In the voluminous work of Bernard de Gordon, entitled "Lilium medicinae," some space is given to diseases of the skin, but there is nothing added to the description of the preceding writers. Gordon speaks of *herpes esthiomenos,* which he considers to be a corrosive ulcer, and he adds that it has been given the name of lupus. He describes *serpigo* and *impetigo* and one may probably infer that both are herpetic processes although it would be difficult to give their exact type. Gordon describes leprosy at length but as this disease is not within the scope of this paper we shall pass it by.

Guy de Chauliac, a contemporary of Gordon, since we know he flourished in the middle of the fourteenth century, speaks of herpes following Galen, and of formis following Avicenna, but far from adding anything to what these two writers had described, he on the contrary makes such important abridgments that I am led to believe that he merely copied them without understanding the subject.

Joubert, in his French translation of Guy de Chauliac, employs the word *dertres* or *dartres,* and says that *impétige, serpige* and *assafaté* (the latter an Arabian word employed by Avicenna) are dartrous processes. He adds:

> All these diseases are infections of the skin and finally develop into ulcers. . . . At the onset they are small and smooth, occupying different parts [of the cutaneous surface] and finally develop into scaling ulcers. . . . Those which do not extend are more properly named *assafati* and *impetigo,* but those which continue to extend [over the cutaneous surface] are called *dertres* and "volatile fire," and these lesions may be either dry or moist.

The Italian surgeon, Joannes de Vigo, reproduced the Arabian doctrines in a confused way, while in France, the surgeon Tagault and Fernel, one of the greatest clinicians in medical history, gave descriptions of remarkable exactitude. Unfortunately, the light they shed upon these lesions was only fleeting and became extinguished with them. Nevertheless, at this epoch of the renaissance of letters, so brilliant in discoveries and advancement of science, the so-called dartrous skin processes were developed, for it must be admitted that before this glorious time, Celsus and Galen alone had been guided by observation only, while those who appeared upon the scene after them merely copied their writings when they did not alter their meaning. In point of fact, Joannes de Vigo simply reproduced the teachings of Avicenna in a servile manner which, as I have already pointed out, was devoid of any originality. De Vigo speaks of *formis,* but it is difficult to recognize the affection of which he speaks. The polypharmacy that he heaves upon us in itself proves, by its stimulating nature, that he is dealing with chronic morbid processes. Thus, de Vigo employed arsenic in many topical applications, combined with many irritating products.[19]

Although in the midst of a somewhat confused erudition, Tagault has left us important data. Thus, after having reviewed incompletely what the ancients had to say in respect of dermatology, he includes the *desuationes* of Avicenna in the exanthemata, hydroa of the Greeks, and the sudamina of Galen in the same class. He is of the opinion that *magnas herpetas, papules* and the *impetigo* of Celsus are herpetic processes and he says: "According to my way of thinking, both species, even the first, are dartrous (herpetic) complications." With Pliny he admits that mentagra is simply *lichen* of the Greek writers and maintains that the latter affection in no way differs from impetigo. In fact, as I shall show, the principal writers call *lichen,* squamous or scaly herpes occupying a limited area of the cutaneous surface, while they apply the term *impetigo* to eczema circinatus involving the entire skin surface. At this epoch also, the French physicians regarded mentagra as belonging to herpetic processes and called it *male dartre.*

In Fernel's works there is to be found a very important chapter on *dartres.* He says: "Dartre is a pruritus which causes the skin to become rough and uneven with many pimples scattered here and there. The

Greeks call this [lesion] herpes." Fernel recognizes what he calls a miliary dartre and a simple dartre "which gives the skin roughness and superficial unevenness, only involving the epidermis and to the development of small pimples which remain localized. These two forms of dartres extend in a circular fashion to the surrounding skin and frequently the central portion becomes cured while the periphery [of the lesion] continues to extend." This description is perfectly applicable to certain types of eczema and lichenoid skin processes. It is also to be remarked that Fernel discards the word pustule and uses pimple in its stead.

It is clear that Fernel had observed cases in his practice and did not merely repeat the descriptions of his predecessors. Further on, he gives some remarkable clinical differentiations of these lesions which, although they show that he included erysipelas in eczematous processes, nevertheless indicate that he had distinct ideas in respect of them. He says: "Erysipelas suddenly develops from a manifest inflammation [*fluxion* in the text] while dartres slowly appear in the form of pimples although no fluxion [inflammation of the integuments] ensues. . . . All dartres are of long duration, never give rise to fever and are cured only with time." He describes impetigo as a rough, hard and dry condition of the skin and supposes it to be the same lesion as the lichen of the Greeks. As to leprosy he says that "It deeply eats into the skin, consumes it and cracks it, and then it falls off in powdery scales or in the form of pale-colored or blackish crusts; it resists all treatment and to cure it the people resort to the healing powers of saints."[20]

Hieronymus Mercurialis gives no classification; he has written chapters describing such or such disease, but Gulielmus de Saliceto and almost all writers before him had done quite as much. Although he compares porrigo with favus and achor, it is because these diseases have so much in common, and like Celsus, Alexander of Tralles and many others, he was forced to arrive at this conclusion by analogy. In his second book, Mercurialis confuses scabies, porrigo and leprosy, all very distinct morbid processes. However, I make no criticism of him in this respect because he had no other pretension, although many have gratuitously supposed the contrary. Under the title of *lichenibus*, Mercurialis speaks of *dartres*, but all in confusion, and mentagra and impetigo which before him had been very completely differentiated, are lost in obscure details.[21]

Ambroise Paré speaks of *dartres* and believes that this cutaneous morbid process is more prone to develop on the palms of the hand; nevertheless, the restorer of French surgery speaks at length of its treatment, although neglecting its clinical history. He says[22]: "Dartres are asperities arising on the cutaneous surface in the form of small elevations, causing severe pruritus and give rise to a serous secretion." Paré simply mentions[23] impetigo, herpes and formica and I am of the opinion that the great surgeon knew of these affections only by name. For example, the *formica* of Avicenna he regards as a different process from herpes. However, to compensate for his shortcomings in dermatology, Paré gives a remarkable account of leprosy.

In the medical works of Gulielmus Rondeletius, of Montpellier, there is a chapter devoted to *furfur*. He says: "Furfures in toto corpore, sed praecipue in partibus in quibus pili nascuntur emergere solent," and from the following sentence it is clear that he is referring to moist eczema: "Accidit autem, cum serosus humore cuticula contentus et mordax adustione factus illam siccat et rodit et scinditque et a subjecta cute evillit; unde tenues et furfuracae scammullae." And afterwards he quite justly remarks that the epidermic sloughs that became detached from the hands and other areas of the cutaneous surface are larger than those from the scalp, and for this reason he calls them squamae:

"Praeterea major et scamma quam capitis furfur. Quia cuticulis est illic magis continua."[24]

Jacques Gillemeau hardly refers to dartrous processes, hence he merely mentions herpes, but he wrote an article on achores which is not devoid of value.[25]

In Bonet's Bibliothéque,[26] Fabricius Hildanus speaks of a corrosive dartre occurring over the entire lower limb following a badly treated burn, and he was able to cure it although other physicians had advised amputation.

Fabricius ab Aquapendente, a student of Fallopius, like Galen distinguishes *herpes miliaris* and *herpes exedans.* He states that the former lesion is composed of pustules which extend progressively to the surrounding parts, while the lesions that had just developed retrogress and give rise to a bloody purulent secretion. Fabricius, in the cure of these affections, had a predilection for natural mineral waters and when these could not be procured he advised the use of sea water or water containing salt to which was added sulphur and alum.[27]

Marcus Aurelius Severinus in his "De Exopyria"[28] simply advises cauterization as treatment for dartrous lesions and for this purpose uses powder. It is difficult to know what meaning he intends to convey afterwards,[29] when he states that lichen holds the place between dartres and phagedena; and lastly, this writer is extremely vague, as was Fabricius de Hilden, in respect of dartrous affections in general.

Pierre LaForest d'Alcmar has recorded many clinical histories of skin diseases, but unfortunately he more particularly stresses their treatment, and even with *a priore* reasoning, it is with difficulty that one can make out the disease he is dealing with. In the first book of his "Observations et Cures de Chirurgie,"[30] he reports two case histories of *herpes esthiomenos* or corrosive dartres, of the lower limbs; he relates three instances of herpes miliaris and several cures of impetigo, serpigo, lichen (herpetic affections) applying indifferently all these names. LaForest was perfectly familiar with leprosy and also speaks of lichen of the hands, which he calls lichenoid squamous.

The second part of the third volume of Bonet's collection contains quite a number of cases of skin disease due to Felix Plater, several of which are herpetic processes, but under the title of herpes, the clinician of Bâle only describes herpes esthiomenus and all his clinical descriptions are so vague that it is difficult to form an exact opinion of what he is attempting to depict. Besides, Plater confuses melitagra with other skin affections presenting crusts, under the heading of scabies or psora.

In Bonet's fourth volume cases of herpetic skin lesions are reported by Nicholas Tulpius, Martin Rulandus, Pierre Pachec, Marcellus Cumanus, H. Reusner, Pierre Pothier, William de Baillou, Philip Greulingius, Thomas Bartholin and others of less note, but their imperfect clinical descriptions leave us in the dark in respect of the diagnosis. However, all of them give the name of herpes to really herpetic lesions, and their treatment is a proof of this. Tulpius is the only one who applies the name of herpes to a type of zona, but if one carefully reads his description it at once becomes evident that he is not dealing with this disease, because he says that the small pimples corrode the skin so deeply that each one forms an ulcer possessing its own slough.

We have now reached the latter half of the eighteenth century, the epoch when Lorry's book, "De morbis cutaneis," appeared and a few years later (1785) Joseph Jakob von Plenck published his "Doctrina de morbis cutaneis," but neither of them made much of any progress in dermatology.

Von Plenck commences his description of leprosy as follows: "Est morbus in quo cutis praesertim faciei rugosa et aspera evadit, atque tuberibus magnis rubro—lividis et rimosis deformatur, cum extremorum artuum insensibilitate et voce rauca nasali."

Lastly, von Plenck places lichen in the class of squamous affections, which is nothing else than herpes circinatus limited to certain areas of the cutaneous surface: "Est macula solitaria, rubra, aspera, sicea, admodum pruriens quae in tenuissimum furfurem solvitur." Following the example of Archigenes, Tagault and Lorry, von Plenck applies the name of impetigo to herpes circinatus and comprises mentagra among lesions presenting crusts.

In conclusion, it should be added that Roussel, in a dissertation published in 1810, states that both Amatus Lusitanus and Morton applied the name of impetigo to herpetic lesions, and his description of melitagra leaves no doubt but that he is depicting herpes miliaris. And lastly, Roussel speaks of herpes esthiomenus without adding much to the subject.

References

1. Traité des affect. past. xxxvi. iii, 350. Trans. by Gardeil, Toulouse, 1801.
2. Celsus. Lib. v, cap. xxviii, De Papulis.
3. *Ibid.*, par. 17.
4. *Idem.* Lib. vi, cap. v, par. 25.
5. *Idem.* Lib. v, cap. xxviii, par. 25.
6. *Idem.* Lib. vi, cap. iii, par. 5.
7. Pliny. Lib. xxvi, cap. i.
8. Galen. De simplicium med. facult. Lib. vi.
9. Dujardin and Peyrilhe, B. Histoire de la Chirurgie. Par., 1774, i, v, 101.
10. Celsus. Lib. v, cap. xxviii, par. 5.
11. Galen. Methodus medendi. Lib. ii, cap. ii.
12. *Idem.* De Tumoribus praeter naturam.
13. Oribasii synopsis. Lib. cii, cap. vii and ix.
14. Aëtius. Tetrabiblion. iv, serm. ii, cap. lx.
15. *Idem*, cap. lxxx.
16. *Idem.* Tetrab. iv, serm. i, cap. cxxviii.
17. Paulus Aegineta. Lib. iv, cap. ii. Ed. J. Cornarium, Basileae, 1556.
18. Avicenna. Lib. iv, fen v, tract. i, cap. vi.
19. Chirurgie de Vigo. Lib. ii, tract. i, cap. vii. Fr. trans., 1537.
20. Fernelius, J. Pathologie. Chap. iv, Des eruptions bilieus. Fr. trans., 1659.
21. Mercurialis, H. De morbis cutaneis. Lib. ii, cap. vi. Basileae, 1577.
22. Paré, A. Livre xx, chap. xiv.
23. *Idem.* Livre vii, chap. vi.
24. Rondeletius, G. Methodus curandorum omnium morborum. Cap. ii. Ed. 1601.
25. Gillemeau, J. Oeuvres chirurgicales. Chap. lxiii and lxv.
26. Bonet, T. Bibliothèque. i, obs. 22.
27. Fabricius. Opera. Pp. 158 *ff.*
28. Severinus, M. A. De Exopyria. Chap. vii, p. 581.
29. *Idem.*, chap. lxvi, p. 615.
30. Bonet, T. *Op. cit.*, iii, obs. 7 *ff.*

PIONEER MEDICINE IN WESTERN PENNSYLVANIA

PART II*

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THREE NOTABLE PARSON PHYSICIANS

Joseph Doddridge

THE fullest biography extant of all the pioneer doctors is that of Rev. Dr. Joseph Doddridge. He was born in Bedford, Pennsylvania, October 14, 1769. His parents moved to Washington County near the West Virginia line in the spring of 1773. His father was a Wesleyan Methodist and shortly after arriving built, on his own farm, a house to be used for divine worship and also for a school. This was for a long time known as Doddridge's Chapel. It was near Independence, Washington County. Joseph went to school in Maryland, but returned in a few years to work on the farm. At nineteen he was a traveling Methodist preacher with the noted Francis Asbury. In 1791 his father died and the care of the family and the farm fell upon him and he therefore had to stop preaching. His desire for learning continued and he and his brother Philip (afterwards a noted jurist and member of Congress of Wellsburg, Virginia) studied at home. Working hard on the farm and in the woods all day, they spent the evening pouring over books in the dim light of the fire. These two boys entered Jefferson Academy in 1791, and a classmate extols their talents in the highest terms. In 1792 Dr. Doddridge was admitted to the Order of Deacons by Bishop White, in Philadelphia, probably while he was studying medicine and completing his course with Dr. Rush, and he was by the same prelate ordained priest in 1800. He was under the necessity of combining his clerical profession and that of medicine in order to obtain support. His amiable wife used to say when speaking of this early period: "He was too poor to buy a suit of clothes and when Saturday afternoon came he was obliged to remain incognito while she adjusted and mended his clothes for his appearance in the pulpit on Sunday, knee breeches and long stockings being then in vogue. Dr. Doddridge founded more than twenty Episcopal Churches in Western Pennsylvania, Virginia and Eastern Ohio. In vain he frequently besought Bishop White to place a Suffragan Bishop in Western Pennsylvania. He lamented that for lack of a bishop the Episcopal Church was losing in her membership.

Both as a priest and a physician, Dr. Doddridge became eminently successful and deservedly popular, and by this means was enabled to educate a large family of children. In later years the Medical Surgical Society of Eastern Ohio elected him honorary member, "Said Society being well convinced of his ability and scientific skill." The writer sending this announcement says: "I do not know, my dear brother, that the accompanying certificate will be acceptable to thee, yet it may at some future day serve to remind thee of the high esteem in which thee is held by such of thy medical brethren as had best opportunity of judging of thy professional and moral worth." Signed Anderson Judkins, 1st day, 12th month, 1812. He was also elected a corresponding member of the Academy of Natural Sciences of Philadelphia. He was a fine conversationalist, fond of society, cheerful and industrious, temperate and domestic.

Dr. Doddridge was accustomed to rise at four o'clock in the morning and set apart these early morning hours for his devotions and literature. The medical profession and the whole country is indebted to him for the well-known book he left, "Doddridge's Notes." In it are many quaint descriptions of the early life, manners and customs of these sturdy pioneers. He reached only his fifty-eighth year of age, dying November 8, 1826, at his home, Wellsburg, Virginia, now West Virginia, where he had gone for his health.

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* Continued from issue of June, 1926, p. 141.

We get a glimpse of the primitive manner of the pioneer living in his description of his first trip east when a boy. "The tavern at which my uncle put up in Bedford was a stone house and to make the change still more complete was plastered inside as to the walls and ceilings. On going into the dining room I was struck with astonishment at the appearance of the house. I had no idea there was any house in the world not built with logs, but here I looked around and could see no logs. I had not the courage to inquire anything about it. When supper came on my 'confusion was worse confounded.' A little cup stood in a bigger one with some brownish looking stuff in it that was neither milk, hominy nor broth. What to do with these little cups and the little spoons belonging to them I could not tell and was afraid to ask. Accustomed to pewter dishes, plates and spoons, gourds and wooden bowls, mush, hominy and maple molasses—a genuine backwoodsman would have thought himself disgraced by showing a fondness for these slops."

Doddridge's Notes, now rare and out of print, may be considered a classic. They are written clearly and simply; the reader receives the impression that they are honest and are accurate and that the writer is a keen observer, discriminating, kindly, friendly and reliable. Aside from their intrinsic worth there is a certain literary charm about the notes which makes them delightful. They reveal a well-balanced, penetrating and scientific type of mind, a man who deeply loved his fellow man.

Believing this the author makes no apology for introducing at this place a considerable number of Doddridge's Notes.

Doddridge was a true naturalist, a lover of Nature, of man, beast, plant and tree. For instance he found much relaxation in the culture of bees; his garden and orchard were both well cultivated. As against the common brutal instinct, he would not kill, nor permit to be killed, any of the birds on his grounds. In 1813 he published a treatise on "Culture of Bees" in which he gives an intimate description of his apiary and tells all his plans for handling bees, which included that of colonizing instead of killing them to procure the fruit of their labor.

Besides his treatise on bees, Doddridge wrote an article entitled "Logan, the Last of the Race of Skikellimus," and in 1825 he commenced a piece called "The Russian Spy," strictures on America, and an Indian novel, neither of which was completed.

After a long illness, Doddridge died in November, 1826, in the fifty-eighth year of his age, in Wellsburg, Brooks County, West Virginia. He was the father of twelve children, eight of whom survived him. Some insight into the character of the man is so well revealed in two letters written by him that I quote them in this place:

Wellsburg, June 4, 1822.

"My Dear Son: It is now early in the morning, and I am pleasantly situated in the bower, which has been removed from the spread apple tree to the saloon—an oblong grass plot, studded on each side by a row of large fruit trees—at the request of your excellent mother, who often has tea and sometimes dinner set in it. She has just risen from a night's repose, looks young and joyous as a girl of eighteen. She is engaged in talking to the gardener, and is feeding about fifty chickens, which are thanking her for her munificence, in their noisy, gabbling way.

"Many changes have been made here since you left us, an account of which will no doubt be acceptable to you. The foundery lot is at present a first rate garden, mostly planted in vegetables. The old garden is enclosed in a close fence, six feet high, and finished with a coping. I have made a flower garden for Susan. It is tastefully laid out in circular beds and if well taken care of, and stocked with flowering shrubs and plants, will in a few years present a fine parterre of variegated beauty. Gardener as

I have always been, Susan is the only one of my family who manifests a taste for this delightful employment; in addition to which I strongly suspect she is to be my prettiest daughter.

"The bees have all been removed to the new bee house, which stands on the northeast lot below the turnpike. It is twenty feet long and eight feet wide, of brick, and plastered inside and out, with a circular dome above. The family vault is of the same dimensions.

"I am at present much amused with the playful gambols of some squirrels which are frisking about, sometimes on the trees, sometimes on the ground. About a month ago, I made a den for some of these little animals, into which I put two pair. They now seem well satisfied, but will they stay or decamp after some time? I am a republican, and like pets but not prisoners. I do not like to see a bird in a cage, or an animal tied by the neck.

"Joseph is still at the seminary, and doing well. He is much beloved by his teacher and fellow students. It is my wish to make him a finished scholar.

"Reeves and Charles are fine little fellows. Charles has the character of a "good boy." Reeves has a little of the Indian in him; but I think not so much as you had at his age. As you are a business man, and will probably become rich, I think you ought to take one of these fine boys and teach him, what he will never learn from his father, the art, trade or mystery of money-making.

"Little Mary has got up and come to me in the bower. Dear little Dutch stumpy, her affection for me is sometimes a little troublesome as her chief concern is to be with me whenever she can find me. . . .

"God bless you and yours, my dear son,
Joseph Doddridge."

Philip B. Doddridge,
Portsmouth, Ohio.

Bedford, Sept. 25, 1824.

"My Dear Wife: We are here. Our progress has been slow; but I have enjoyed the journey, and think my health is somewhat improved.

"The mountain scenery through which we passed is varied, some beautiful, some grand and sublime beyond description. Whilst gazing with delight upon these displays of the Creator's power and goodness, my pleasure was suddenly checked by the reflection that these faculties by means of which I now hold communion with the beautiful in nature must soon be closed in death. But thanks be to Him, who made all things, I can look forward by faith to a world where beauty, peace, and purity are eternal, where none shall know sickness and weariness, such as I now feel.

"At Brownsville and Uniontown, I was invited to officiate, which I did, at the latter place baptizing two children. Having preached in this place also. Thus without expecting it, I have become a missionary.

"Before arriving here, I intended, if possible, to find the house in which I first drank coffee in 1777 and in the event of finding it, to invite a few friends to take a cup with me in the same room. Remembering the name of the landlord, Nagel, and being able to give a tolerable description of the house, I found upon enquiring that Dillions's Hotel, where we put up, now occupies the site of Nagel's house.

"Yesterday I went out to see the famous Bedford springs, about two miles from the town. The site, owing to the surrounding mountains, is highly romantic. The buildings of this water place consist of baths, boarding-houses and dormitories. The great Hall for amusements presents many fanciful and gorgeous decorations. On a low piece of ground, some distance from the Hall, on a pedestal of rock, stands a naiad, a large half naked female figure, with a Grecian face and costume, holding in her left hand a huge concha, from the top of which the water of the spring is thrown upward to the height of ten or twelve feet; but poor girl, her fine white drapery is turning yellow, from the action of the sulphate of iron contained in the water which is constantly falling on it.

"The spring issues from the western side of the Cove mountain, at the height of nearly twenty feet above the creek which runs at its base. It is large and rises with great force through apertures in immense rocks, which still retain their primitive situation and aspect. A few rods higher up is another but smaller spring. The water of the principal spring is conducted into a large reservoir, supplying a long range of baths, which are filled at pleasure, by raising a small flood-gate. The water in the baths is reached by a flight of steps. I had not, however, the courage to make the descent. The side of the mountain from which the spring issues is cut into serpentine walks, for the convenience and benefit of pedestrians who wish to take exercise and inhale the mountain air.

"I have been examining the older records here, for names of my family, but can only find that of my grandfather, Joseph Doddridge, who is mentioned as foreman of a grand jury in 1777.

"Being within ten miles of the place of my nativity, I wished to learn something concerning my father's title to the land on which he lived in Friend's Cove, but could find nothing, as his title, whatever it was, originated when this was part of Cumberland County. I am informed here, that the land is now owned by a Mr. Cissner and that my father was unjustly deprived of it, but by whom I have not learned.

"The Court House here was built in the reign of George III. The edifice is of stone, and is, without exception, the most misshapen, sombre-looking building I ever saw. I do not think the Bastile itself could have presented a more forbidding and gloomy aspect. I seated myself for a moment on the bench of justice, and after taking a survey of the antiquated, ill-shapen jury-boxes, and council-table gladly made my escape from the forum of my forefathers.

Jos. Doddridge."

Doddridge's Notes were written in 1824, about two years before his death. The title page of the copy with the Notes which were reprinted in 1876 follows:

NOTES
on the
SETTLEMENT AND INDIAN WARS
of the western parts of
VIRGINIA AND PENNSYLVANIA
from 1763 to 1783, inclusive
Together with a
View of the State of Society, and Manners of the
First Settlers of the Western Country.
By Joseph Doddridge
with
A MEMOIR OF THE AUTHOR
by his Daughter
Edited by Alfred Williams.
Albany, N. Y.
Joel Munsell
1876

From these notes several quotations are given which are of intrinsic worth and which reveal in almost every line the author himself.

DODDRIDGE'S NOTES

Wolves; Hydrophobia. The wolves, formerly so numerous, and so destructive to the cattle, are now seldom heard of in our older settlements. It may seem strange that this ferocious and cunning animal, so long the scourge of the mountainous districts of Europe, should have so suddenly disappeared from our infant country. The sagacity of the wolves bids defiance to the most consummate craft of the hunters, many of whom, throughout life, never obtained a single chance to shoot at one of them. Sometimes, indeed they outwit them by pit-falls and steel traps; but no great number were killed by either of these means; nor had the price set upon their scalps by the state legislature any great effect in diminishing their number and depredations. By what means then did their destruction happen? On this subject I will hazard the opinion that a greater number of them were destroyed by hydrophobia than by all other means put together. That this disease took place among them at an early period is evident from the fact that nearly forty years ago, a Captain Rankin of Raccoon Creek, in Washington County, Pa. was bitten by a mad wolf. A few years ago, Mr. John M'Camant of this county met with the same misfortune. In both cases the wolf was killed, and I am sorry to add both these men died, after having suffered all the pains and horrors accompanying that most frightful of all diseases, that inflicted by the bite of a rabid animal.

An animal so ferocious as a wolf, and under the influence of madness, bites everything he can reach; of course the companions of his own den and thicket are the first victims of his rage. Hence, a single wolf would be the means of destroying the whole number of his fellows, in his immediate neighborhood at least. In the advanced state of the disease they lose their native wildness, leave their dens and thickets and seek the flocks and herds about farm houses, and in some instances have attempted to enter the houses themselves for the purpose of doing mischief.

Captain Rankin was bitten by a wolf in his own door. Hearing in the dead of night a noise among his beasts in the yard, he got up and opened the upper part of his door, which was a double one. The wolf instantly made a spring to get into the house. Rankin with great presence of mind caught the wolf in his arms as he was passing over the lower door and held him fast on its upper edge and against the door post, until a man belonging to the household jumped out of bed and got a knife and cut the wolf's throat; but the wolf in the mean time bit him severely in the wrist. If I recollect rightly, he lived but a short time afterwards.

A Case of Hydrophobia. Mr. John M'Camant, who lived a few miles from this place on the road to Washington, met a similar death much in the same way. Hearing an uproar among his beasts, not far from the house, he went to see what was the matter. He had not gone far before a wolf sprang at him and bit him severely in the left breast. Being a very strong, resolute man, he caught the wolf by the jaws and held them apart calling an apprentice lad to bring an axe to knock the wolf in the head. He came with all speed, but finding he had no chance of striking the wolf, without risking an injury to his master, he dropped the axe, ran back to the house and got a butcher knife, with which he cut the wolf's throat. It was between seven and eight weeks before the virus took effect, so as to produce the symptoms of the terrible disease which followed.

From the time I first heard of his being bitten by a wolf, I anticipated the consequence with horror, and the more so, because he applied to a physician who had the reputation of curing the bite of a mad animal with a single pill. Placing confidence in this nostrum, he neglected all other medical aid. In this pill I had no confidence, having previously seen and examined one of them and found it made of ingredients possessed of scracely any medical efficacy whatever. On the Thursday preceding his death, he became slightly indisposed. On Friday and Saturday he had the appearance of a person taking an intermittent fever. On Saturday the hydrophobia came on. It was then I first saw him. Having never seen the disease before, I was struck with consternation at his appearance. Every sense seemed to have acquired a hundred fold excitability. The slightest impression upon any of them, gave him a thrill of the deepest horror. Noise, the sight of colored clothing, the sudden passage of any person between him and the light of the window or candle, affected him beyond description.

On Sunday night his convulsive fits came on. He was then fastened by his hands and feet to the bed posts, to prevent him from doing mischief. At three o'clock on Monday evening he became delirious, his fits ceased, and at two o'clock in the morning death put a period to his sufferings.

It is impossible for language to describe this terrible disease. The horror of mind which he continually suffered, was equal to that which would be felt by the most timid lady, on being compelled to go alone at midnight into a graveyard, with the entire certainty of seeing a ghost in the most frightful form which a disordered imagination ever ascribed to a departed spirit. He several times requested the physicians to bleed him to death. Several veins were opened; but the blood had so far lodged itself in the engorgement of the viscera that none could be discharged from the veins. He then requested that some of his limbs might be cut off, that the same object might be effected that way. Finding this request would not be complied with, he looked up to his rifle, and begged me with tears in his eyes to take it down and shoot him through the head, saying: "I will look at you with delight and thankfulness, while you are pulling the trigger. In doing this you will do right. I know from your countenance that you pity me; but you know not the thousandth part of what I suffer. You ought to put an end to my misery, and God himself will not blame you for doing so." What made these requests the more distressing, was the circumstance that they did not proceed from any derangement of mind, on the contrary, excepting during the time of his fits, which lasted only a few seconds at a time, he was in the full exercise of his understanding. His discourse until about three o'clock Monday evening was quite rational. He requested prayers to be made for him, and deliberately gave directions about the place of his interment and funeral sermon, all of which requests were complied with.

The reader, no doubt, wishes to know as much as possible concerning the famous pill, an improper reliance on which terminated in the death of Mr. M'Cammant. I have had an opportunity of examining two of them at a considerable distance of time apart. The first I saw was about five times as large as one of Anderson's pills, and composed of Burgundy pitch and green rue. The second was made of the same material, with a narrow strip of paper rolled up in the middle of it. This paper contained about a dozen ill-shapen letters, but not so arranged as to spell any word in any language with which I am acquainted. The physician who gave these pills reported he got the recipe for making them from a priest of Abyssinia. Such is the superstition which still remains attached to the practice of the healing art, and from which in all likelihood, it will never be separated. But why then the celebrity of this pill, as a preventive of canine madness? Has it never had the effect ascribed to it? Certainly never.

By far the greater number of those who are said to be bitten by rabid animals have been bitten by animals either not really mad, or not in such state of madness as to communicate the disease.

An event which fell under my own observation several years ago will serve to explain the matter. Several children, one of whom was my own, were said to have been bitten by a mad cat, which was instantly killed. On inquiry I found that there was no report of mad animals in the neighborhood. I then gave it as my opinion that the apparent madness of the cat proceeded only from caterwauling. This did not satisfy anyone but myself, so I had to treat the children as I should have, if the cat had been really mad, and thus got the credit of curing four cases of canine madness; a credit which I never deserved.

A few years ago, a gentleman of my neighborhood brought me his daughter whom he said had been bitten by a mad cat. I asked if the cat was a male one. He answered in the affirmative. He said he had imprisoned him in a closet. I am glad of that, said I; keep him there a few days, and you will find him as well as ever he was: and so it turned out.

Dogs are subject to similar madness from the same cause. In this state like cats, they are apt to bite even their best friends. In this case the animal is reported mad and instantly killed. In such cases these pills, as well as other nostrums for this disease, do wonders; and that is where there is nothing to be done.

Diseases and Their Remedies. This, amongst a rude and illiterate people, consisted mostly of specifics. As far as I can recollect them they shall be enumerated, together with the diseases for which they were used.

The diseases of children were mostly ascribed to worms, for the expulsion of which a solution of common salt was given. The dose was always large. I well remember, having been compelled to take half a tablespoonful, when quite small. To the best of my recollection it generally answered the purpose. Scrapings of pewter spoons, was another remedy for the worms. This dose was also large, amounting to, I should think, from twenty to forty grains. It was commonly given in sugar. Sulphate of iron, or green copperas, was a third remedy for worms. The dose of this also was larger than we should venture to give at this time.

For burns a poultice of Indian meal was a common remedy. A poultice of scraped potatoes was also a favorite remedy with some people. Roasted turnips made into a poultice, was used by others. Slippery elm bark was often used in the same way. I do not recall that any internal remedy, or bleeding was ever used for burns.

The croup, or what was then called the *bold hives*, was a common disease among the children, many of whom died of it. For the cure of this, the juice of roasted onions or garlic was given in large doses. Wall ink was also a favorite remedy with many of the old ladies. For fevers, sweating was the general remedy. This was generally performed by means of a strong decoction of Virginia snake root. The dose was always very large. If a purge was used, it was about half a pint of a strong decoction of white walnut bark. This when it was intended for a purge was peeled downward; if for a vomit, it was peeled upwards. Indian physic, or bowman root, a species of epicauanha was frequently used for a vomit, and sometimes the pocoon or blood root.

Snake Bites. For the bite of a rattle, or copper snake, a great variety of specifics was used. I remember when a small boy to have seen a man bitten by a rattle snake brought into the fort on a man's back. One of the company dragged the snake after him by a forked stick fastened in its head. The body of the snake was cut into pieces of about two inches in length, split open in succession, and laid in the wound to draw out the poison, as he expressed it. When this was over, a fire was kindled up in the fort yard and the whole of the serpent burned to ashes, by way of revenge for the injury he had done. After this process was over, a large quantity of chestnut leaves was collected and boiled in a pot. The whole of the wounded man's leg and part of his thigh were placed in a piece of chestnut bark, fresh from the tree, and the decoction poured on the leg so as to run down into the pot again; after continuing this process for some time, a quantity of the boiled leaves were bound to the leg. This was repeated several times a day. The man got well; but whether owing to the treatment bestowed on his wound, it is not certain.

A number of native plants were used for the cure of snake bites, among them the white plantain held a high rank. This was boiled in milk and the decoction given the patient in large quantities. A kind of fern, which from its resemblance to the leaves of walnut, was called walnut fern, was another remedy. A plant with fibrous roots, resembling the seneka-snake root, of black color and a strong, but not disagreeable smell, was considered and relied on as the Indian specific for the cure of the sting of a snake. A decoction of this root was also used for the cure of colds. Another plant which very much resembled the one above mentioned, but violently poisonous, was sometimes mistaken for it and used in its place. I knew two young women who in consequence of being bitten by rattlesnakes used the poisonous plant instead of the other, and nearly lost their lives by the mistake. The roots were applied to their legs in the form of a poultice; the violent burning and swelling occasioned by the inflammation, discovered the mistake in time to prevent them from taking any of the decoction, which had they done it, would have been fatal. It was with difficulty that the part to which the poultice was applied was saved from mortification, so that the remedy was far worse than the disease.

Cupping, sucking the wound, and making deep incisions which were filled with salt and gun powder, were among the remedies for snake bites. It does not appear to me, that any of the internal remedies used by the Indians or the first settlers of this country, were well adapted for the cure of the disease, occasioned by the bite of a snake. The poison of a snake, like that of a bee or wasp, must consist of a highly concentrated and very poisonous acid, which instantly inflames the part to which it is applied. That any substance whatever can act as a specific for the decomposition of this poison, seems altogether doubtful. The cure of the fever occasioned by this animal poison, must be effected with reference to those general indications which are regarded in the cure of other fevers of equal force. The internal remedies alluded to, so far as I am acquainted with them, are possessed of little or no medical efficacy. They are not emetics, cathartics, or sudorifics. What then? They are harmless substances which do wonders in all these cases in which there is nothing to be done.

The truth is, the bite of a rattle or copper snake in the fleshy or tendinous part, where the blood vessels are neither numerous nor large, soon heals under any kind of treatment. But when the fangs of the serpent, which are hollow and eject the poison through an orifice near the points, penetrate a blood vessel of any considerable size, a malignant and incurable fever was generally the immediate consequence and the patient expired in the first paroxysm. The same observation applies to the effects of the bite of serpents when inflicted on beasts. Horses were frequently killed by them, as they were commonly bitten about the nose, in which the blood vessels are large and numerous. I once saw a horse die of the bite of a rattlesnake. The blood for some time before he died, exuded in great quantities through the pores of the skin.

Cattle were less frequently killed, because their noses are of a gristly texture, and less furnished with blood vessels than those of a horse. Dogs were some times bitten and being natural physicians, they commonly scratched a hole in some damp place and held the wounded part in the ground until the inflammation abated.

Hogs when in tolerable order, were never hurt by them owing to their thick substratum of fat between the skin, muscular flesh and blood vessels. The hog generally took immediate revenge for the injury done him, by instantly tearing to pieces and devouring the serpent which inflicted it.

The itch, which was a very common disease in early times, was commonly cured by an ointment made of brimstone and hog's lard.

Gunshot and other wounds were treated with slippery elm bark, flax seed and other such like poultices. Many lost their lives from wounds which would now be considered trifling and easily cured. The use of the lancet and other means of depletion in the treatment of wounds, constituted no part of their cure in this country in early times.

My mother died in early life of a wound from the tread of a horse which any person in the habit of letting blood might have cured by two or three bleedings, without any other remedy. The wound was poulticed with spikenard roots and soon terminated in an extensive mortification.

Most of the men of the early settlers of this country were affected with the rheumatism. For relief of this disease, the hunters generally slept with their feet to the fire. From this practice they certainly derived much advantage. The oil of rattlesnakes, geese, wolves, bears, raccoons, groundhogs and polecats, was applied to swelled joints and bathed in before the fire.

The pleurisy was the only disease which was supposed to require blood-letting; but in many cases a bleeder was not to be had.

Coughs and pulmonary consumptions were treated with a great variety of syrups, the principal ingredients of which were commonly spikenard and elecampane. These syrups gave but little relief.

Charms and incantations were in use for the cure of many diseases. I learned, when young, the incantation in German, for the cure of burns, stopping blood, for the toothache, and the charm against bullets in battle, but for the want of faith in their efficacy, I never used any of them.

The erysipelas, or St. Anthony's fire, was circumscribed by the blood of a black cat. Hence there was scarcely a black cat to be seen, whose ears or tail had not been frequently cropped, for a contribution of blood.

Whether the medical profession is productive of most good or harm, may still be a matter of dispute with some philosophers who never saw any condition of society in which there were no physicians, and therefore could not be furnished a proper test for deciding the question. Had a believer in the healing art been amongst the early inhabitants of this country, he would have been in a proper situation to witness the consequences of the want of the exercise of this art. For many years in succession there was no proper person who bore the name of a doctor within considerable distance of the residence of my father. For the honor of the medical profession I must give it as my opinion, that many of our people perished for want of medical skill and attention.

The pleurisy was the only disease which was, in any considerable degree understood by our people. A pain in the side called for the use of the lancet, if there was any to be had; but owing to the sparing use, the patient was apt to be left with a spitting of blood, which sometimes ended in consumption. A great number of children died of croup. Remittent and intermittent fevers were treated with warm drinks, for the purpose of sweating. The patients were denied the use of cold water and fresh air. Many of them died. Of those who escaped, not a few died afterwards of the dropsy or consumption; or were left with paralytic limbs. Deaths in childbed were not infrequent. Many no doubt, died of the bite of serpents in consequence of an improper reliance on specifics possessed of no medical virtue.

My father died of an hepatitis, at the age of forty-six. He labored under this disease for thirteen years. The fever which accompanied it was called the "dumb ague" and the swelling in the region of the liver "the ague cake." The abscess burst and discharged a large quantity of matter which put a period to his life, in about thirty hours after the commencement of the discharge.

Thus, I for one, may say that in all human probability, I lost both parents for want of medical aid.

Witchcraft. I shall not be lengthy on this subject. The belief in witchcraft was prevalent among the early settlers of the western country. To the witch was ascribed the tremendous power of inflicting strange and incurable diseases, particularly on children, of destroying cattle by shooting them with hair balls and a great variety of other means of destruction, of inflicting spells and curses on guns and other things, and lastly of changing men into horses and after bridling and saddling them riding them in full speed over hill and dale to their frolics and other places of rendezvous. More ample powers of mischief than these cannot well be imagined.

Wizards were men supposed to possess the same mischievous powers as witches; but these were seldom exercised for bad purposes. The powers of the wizards were exercised almost exclusively for the purpose of counteracting the malevolent influences of the witches of the other sex. I have known several of these witch masters, as they were called, who made a public profession of curing the disease inflicted by the influence of witches, and I have known respectable physicians who had no greater portion of business in the line of their profession than many of those witch masters had in theirs.

The means by which the witch was supposed to inflict diseases, curses and spells, I never could learn. They were occult sciences, which no one was supposed to understand, excepting the witch herself, and no wonder, as no such arts ever existed in any country.

The first German glass blowers in this country, drove the witches out of their furnaces by throwing living puppies into them.

The greater or less amount of belief in witchcraft, necromancy and astrology serves to show the amount of philosophical science in any country. Ignorance is always associated with superstition, which, presenting an endless variety of sources of hope and fear, with regard to the good or bad fortunes of life, keep the benighted mind continually harassed with groundless and delusive, but strong and often deeply distressing impressions of a false faith. For this disease of the mind there is no cure but that of philosophy. This science shows to the enlightened reason of man, that no effect whatever can be produced in the physical world, without a corresponding cause. This science announces that the death bell is but a momentary morbid motion of the ear, and the death watch the noise of a bug in the wall, and that the howling of the dog, and the croaking of the raven are but the natural languages of the beast and fowl, and no way prophetic of the death of the sick. The comet, which used to shake pestilence and war from its fiery train, is now viewed with as little emotion as the movements of Jupiter and Saturn in their respective orbits.

Crime. The greater the amount of freedom, the greater the necessity of a steady and faithful administration of justice; but more especially of criminal justice, because a general diffusion of science, while it produces the most salutary effect on a general scale, produces also the worst crimes by creating the greater capacity for their commission. There is scarcely any art or science, which is not in some hands, and certain circumstances, made an instrument of the most atrocious vices. The arts of navigation and gunnery, so necessary for the wealth and defense of a nation, have often degenerated into the crime of piracy. The beautiful art of engraving and the most useful art of writing, have been used by the fraudulent for counterfeiting all kinds of public and private documents of credit. Were it not for science and freedom, the important professions of theology and physic would not be so frequently assumed by the pseudo priest and the quack, without previous acquirements, without rights and for purposes wholly base and unwarrantable. . . .

Still it may be asked whether facts warrant the belief that the scale is fairly turned in favor of science, piety and civilization; whether in regard to these important endowments of our nature, the present time is better than the past, and the future likely to be better than the present. Whether we may safely consider our political institutions so matured and settled that our personal liberty, property and sacred honor are not only secured to us for the present, but likely to remain the inheritance of our children for generations yet to come. Society in its best state resembles a sleeping volcano, as to the amount of latent moral evil which it always contains. It is enough for public safety, and all that can be reasonably expected, that the good preponderate over the evil. The moral and political means which have been so successfully employed for preventing a revolutionary explosion, have, as we trust, procrastinated the danger of such an event for a long time to come. If we have criminals, they are speedily pursued and brought to justice.

REV. CEPHAS DODD

Besides Doddridge, another man, in the person of Cephas Dodd, studied and practiced both theology and medicine. Like Doddridge, he studied at Jefferson College under Rev. John McMillan and like Doddridge he studied theology first and medicine afterwards, acting on the suggestion of his friend, Dr. Henry Blachly. It appeared that he first studied medicine to make him more effective as a minister of the gospel, but as time went on his practice grew to large proportions. He exercised a sphere of wide influence in the community in which he lived and he was a credit to himself as well as to both professions. He died at the age of seventy-nine, leaving behind him one son, Thaddeus Dodd, and a grandson, W. S. Dodd of Washington, Pennsylvania.

REV. JACOB JENNINGS

In Dr. Jacob Jennings we have another example of a man who preached the gospel and practiced medicine. Dr. Jennings practiced medicine in New Jersey until he was licensed to preach, when he moved to Westmoreland County. Here he exercised the duties of a physician and minister of the gospel from 1792 to 1811. He died in 1813. His son, Ebenezer Jennings, settled near Burgettstown, Westmoreland County, and became famous as a promoter of the practice of vaccination. He died in 1808 at the early age of thirty-three.

PHYSICIANS OF THE FIRST HALF OF THE NINETEENTH CENTURY

DR. DAVID WISHART

Dr. David Wishart was the first of four generations of physicians to practice in Pittsburgh. He was born in Perthshire, Scotland, in 1796 and upon emigrating to this country he settled in Huntington and later in Bedford County. Here his son, John, who was born in Scotland, began the study of medicine and in 1808 was graduated from the University of Pennsylvania. He at once began the practice of medicine in Washington, where he attained first rank as practicing surgeon and consultant.

His son, John W. Wishart, was also graduated from the University of Pennsylvania and served as surgeon in the 140th Pennsylvania Regiment of Volunteers. After the war he settled in Pittsburgh where he resided until his death a few years ago. His son, Charles A. Wishart, followed his father's footsteps; after engaging in general practice of medicine several years he took up the specialty of ophthalmology, which he pursued until his death a few years ago. He was one of the founders of the Eye and Ear Hospital.

JOEL LEWIS

Dr. Joel Lewis was born in Delaware in 1790. He studied medicine at the University of Pennsylvania; among his teachers were Rush, Chapman and Physick. He began the practice of medicine in 1811, immediately after he had gained the degree of M.D. He was a skilled surgeon and deeply devoted to his profession. He was an ardent patriot and in 1822 was made brigadier-general of the 15th Division of the Pennsylvania Militia. The same year another honor came to him when he was made president of the Pittsburgh Medical School which had been founded the previous year. But his promising career was short, for he died March 28, 1824. Dr. Lewis inherited much real estate from his maternal grandfather, who settled in Pittsburgh during the Revolutionary War. A granddaughter, widow of Dr. Frank Le Moyne, recently died in Pittsburgh.

JAMES AGNEW

Dr. James Agnew was the father of Daniel Agnew, of Beaver (afterwards Chief-Justice of the Supreme Court). He came to Pittsburgh from Philadelphia in 1815 where he began the practice of medicine and very soon attained an enviable position in the profession. Dr. Agnew was associated with Dr. Simpson, another physician of note of that day. An advertisement in the City Directory stated they were ready for business and one or the other would always be at the shop. These two physicians probably conducted the first drug store and drug warehouse in Pittsburgh. Another practitioner of early days was Dr. Dimmitt, who was associated with Dr. Agnew in the practice of medicine. To him is credited the distinction of having been the first physician west of the mountains to use Jenner's method of vaccination.

J. P. GAZZAM

Among the early nineteenth century physicians must be recorded a student of Dr. George Dawson who was born in England and came to this country in 1780. Dr. Gazzam was designed to cut a great figure in Pittsburgh life and exercise a wide influence. Once he was chosen state senator. From the year 1817, when he was graduated, from the University of Pennsylvania, he continued in the practice of medicine in Pittsburgh until his death in 1863.

During his lifetime he encountered several epidemics of cholera and smallpox in Pittsburgh. He was here when the fire of 1845 occurred. He witnessed and took part in the founding of the Pittsburgh Medical Society in 1821 and the Allegheny Medical Society in 1848, and he saw the birth of the Mercy, Passavant and West Penn Hospitals. He died two years before the Allegheny County Medical Society was formed. His brother Edward was also a physician but devoted most of his life to politics. In 1825 he made the address of welcome to Lafayette, having been chosen on account of his eloquence.

The Pittsburgh Directory for 1815 contains the names of William S. Coxe, Morrell Parker and Edward Pennington, physicians, as well as those of Bedford, Mowry, Stevenson, Dawson and Lewis. Of these first three no records are to be had, and only their names remain to tell the story of their lives and labors. From a memorandum of the late Dr. James Speer, the roster of the Physicians of Allegheny County in 1828, shortly after he began the practice of medicine in Pittsburgh, is as follows: Peter Mowry, James Agnew, William Simpson, J. P. Gazzam, Felix Brunot, S. R. Holmes, C. L. Armstrong, W. E. Irwin, J. H. Irwin, William Church, William Addison, L. Callahan, Henry Hannen, H. D. Sellers, John T. Stone, Thomas Miller, David Raynolds and James Speer. In 1832 Dr. Speer adds the following names to the list: Jeremiah Brooks, T. F. Dale, Ed. D. Gazzam, Adam Hays, Ebenezer Henderson, William Hughey, Jonas McClintock, A. N. McDowell, John Roseburg, J. H. Smith, William Woods and Robert Wray.

S. R. HOLMES

Dr. Holmes, one of Dr. Mowry's students, arose to a position of distinction in this community. He was "conspicuous by his handsome presence and the spirited gray horse he rode." He was said to be one of the most popular physicians of the early twenties.

JOHN ROSEBURG

Dr. Roseburg was a scion of an old Pittsburgh family. He died of Asiatic cholera at Poland, Ohio, in 1833 at the early age of thirty. Although he died so early he had become a physician of great note and president of the Pittsburgh Council and was the founder of the Duquesne Grays, a notable military organization.

JAMES SPEER

Dr. James Speer was a notable figure in the medical practice of Pittsburgh in the early part of the nineteenth century. He came to Pittsburgh in 1825 and continued in practice there until his death in 1891 at the age of ninety-five. Dr. Speer at once took rank as surgeon and made a specialty of ophthalmology. It is said he performed the operation for the removal of cataract more than six hundred times. He founded the Allegheny Cemetery.

THE IRWIN FAMILY

For many years in the early part of the nineteenth century, Dr. Lewis Irwin was a prominent physician in Pittsburgh. Dr. John H. Irwin was associated with Southside practice. Another Irwin was called

"Devil John" on account of his dashing and reckless manner.

JONAS MCCLINTOCK

Dr. Jonas McClintock, besides working indefatigably as a physician, was also much concerned with municipal affairs. He was born in 1807 and died in 1879. He was trusted by all people in every relation of life and enjoyed their confidence as have few men. He was easily elected mayor and all through his career was conspicuous in public service.

JEREMIAH BROOKS

Dr. Jeremiah Brooks was born February 24, 1797, in New Jersey and located in Pittsburgh in 1830. He enjoyed a large practice and the esteem of all who knew him. He was active in the organization of the Passavant Hospital and was connected with it as long as he lived. He died August 27, 1865.

WILLIAM ADDISON

Dr. William Addison was the son of the distinguished jurist who was impeached as a result of political connivance which was rife about the year 1800. Dr. Addison studied both in America and France. He was a noted historian and naturalist as well as physician. He edited a dictionary on ornithology. Dr. Addison associated himself in the practice of medicine with his brother-in-law, Peter Mowry. He is said to have been of studious habits and his eccentric temper somewhat isolated him from his fellow practitioners, but his great ability and sterling worth were everywhere recognized.

DAVID ALTER

Dr. David Alter (1807–1881) was born in Westmoreland County, his father was a Swiss and his mother a German. His early educational opportunities were most meager. He was graduated from the Reformed Medical College of the United States, an institution of the Eclectic and Botanic School. His career as a physician is unimportant, but living in a quiet obscure country town he made investigations of far-reaching importance.

At the age of eight or nine he was greatly impressed by reading the life of Benjamin Franklin and was strongly drawn to the study of electricity. He independently perfected an electric telegraph in 1836; in 1837 he published in the *Kittanining Gazette* an article on the use of electricity as a motive power. In 1845 Dr. Alter engaged in the manufacture of bromine by a process which he and his partner invented and patented. A large jar of this was exhibited at the World's Fair in New York in 1853. He also invented a process for extracting oil from coal; but the greatest invention of this ingenious man was the discovery and application of the principle of prism to the spectrum analysis. His discovery antedates that of Kirchoff.

THE DICKSON FAMILY

Dr. John Dickson of Pittsburgh was born in Cecil County, Maryland, May 24, 1812. His parents, John and Mary Dickson, were of Scotch-Irish descent. After a preparatory course he entered the Academy at Clinton, Pennsylvania, whence he graduated at the age of sixteen and immediately became a teacher in the district schools of Allegheny County. He attended medical lectures for two years in New York and graduated from New York University. Beginning practice in Sewickley, Allegheny County, he removed ten years later to Pittsburgh, retaining, however, his Sewickley practice. After the lapse of another ten years he returned to Sewickley, but without resigning his Pittsburgh practice. He was married in 1840 to Mary Way, and had eight children; two, John S. and Joseph H., graduated from Jefferson Medical College, Philadelphia, and were associated with their father in practice, Joseph attaining a fine city, state and national distinction as a surgeon.

Dr. Thomas Dickson, a younger brother of John Dickson, fell a sacrifice for his country in 1862. He contracted pernicious malaria while with the Army of the Potomac in the Peninsular Campaign and reached home only to die.

Dr. John S. Dickson was born April 11, 1844. He received his degree at Jefferson Medical College in 1868 and then studied abroad for two years. He was a surgeon of marked ability and a successful physician. He died September 14, 1892.

Joseph N. Dickson was born April 8, 1848. He was a graduate of Jefferson (1869) and like his brother, spent two years in London and Paris. "Dr. Joe," as he was familiarly called, inherited a full measure of his father's surgical tastes and abilities. He was a popular physician, a keen sportsman, an ardent lover of Nature and a genial kindly companion.

GEORGE BRUCE

Dr. George Bruce was born in Pittsburgh in 1811 and died May 29, 1891. He was also a student of medicine in the office of Dr. J. P. Gazzam. He was graduated from the University of Pennsylvania in 1833 and later spent two years in the hospitals and medical schools of Edinburgh and Paris. While in Europe he gave special attention to the heart and lungs and was an acknowledged authority on diseases of those organs. As a practitioner he was preeminently successful and is gratefully remembered by many of our older citizens.

WILLIAM C. REITER

A memorable figure in the local history of medicine is that of W. C. Reiter, born in Pittsburgh March 25, 1817. He began the study of medicine in the office of Dr. Postlethwait of Greensburg, Pennsylvania, and was graduated in 1839 from Jefferson Medical College. He at first practiced in Mt. Pleasant but in 1856 moved to Pittsburgh, where he was actively engaged until his death November 29, 1882. Dr. Reiter was in many respects a remarkable man. He was a bold practitioner and an original thinker. He was a thorough lover of Nature and his ever youthful enthusiasm, keen observation and graphic speech made him a most entertaining companion. Among physicians he will be best remembered by his brochure on diphtheria, and whatever merit attaches to the heroic use of calomel in that disease belongs to Dr. Reiter.

ALBERT G. WALTER

To Albert G. Walter must be accorded the first place of distinction in the medical annals of Pittsburgh.[1] He was a most picturesque character, a man of unbounded enthusiasm and capacity for work, a man of great talent, exceedingly ingenious, resourceful and creative; a man of imagination and courage, he was an isolated figure in the medical world of his day. His makeup and temperament were such that he was constantly in hot water. His was a tumultuous and tempestuous life. He had many professional enemies in Pittsburgh; even the few who admired him, feared him.[2] He relates, himself, that on one occasion efforts were made by rival practitioners to instigate malpractice suits against him, and he in turn instigated a number of such suits.[3] The story is told that an actual attempt was made to lynch him in the Hill District when he had got himself into some sort of a broil.

Walter was born in Germany, June 21, 1811. He was left an orphan at the age of four. He received the degree of Doctor of Medicine from Königsburg and afterward took a year's post-graduate course in Berlin. He was a pupil and assistant of the celebrated Dieffenbach and at the latter's suggestion emigrated to America. On this voyage he was shipwrecked upon the coast of Norway and lost all his belongings.

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[1] For valuable aid in the preparation of the sketch of Dr. Walter, I am indebted to his grandson, Mr. Albert Wallace, and to Drs. Otto Gaub, John J. Buchanan and H. H. Clark.

[2] Among the colleagues with whom Walter remained friendly were Drs. T. W. Shaw, J. P. Gazzam and Coffey.

[3] A brief search in the prothonotary's office in the Pittsburgh Court House shows that in the year 1866 and 1872 Walter was engaged in malpractice suits.

With other passengers, he landed in London without friends or resources of any sort. He procured a position as clerk in a law office where he worked a year and thereby earned money to continue his journey to America. During his enforced stay in London, he attended medical lectures and especially profitted by those of Sir Astley Cooper, who always afterwards remained his friend.

Upon his arrival in New York, Walter found the profession unsympathetic; there was "no room for a Dutchman." By manual labor he earned enough money to take him to Philadelphia, but meeting a similar reception there he shortly afterward left for Nashville, Tennessee. After practicing there for two years he came to Pittsburgh, in 1837, where he remained in active practice until his death on October 14, 1876.

When he came to Pittsburgh he was extremely poor. He was befriended by George W. Jackson, father of J. B. Jackson, who always remained his friend and at this time advanced him sufficient money to buy a horse. He opened an office on Liberty Avenue near Ferry Street. Later he moved to Fifth Avenue at the corner of Cherry Alley. He hesitated to make this move, fearing it was too far removed from the center of population. Afterwards he moved a square north, to Sixth Avenue, where he resided until the day of his death. In 1846 he married Miss Francis Anne Butler, daughter of Major John J. Butler of the United States arsenal, and niece of Dr. J. P. Gazzam. Dr. Walter was very happy in his family life and deeply devoted to his wife and children. Of his four children, two died in childhood, but a son and daughter survived him and the latter, Mrs. Wallace, and several grandchildren are still living in Pittsburgh. Fearing tuberculosis in his son, he sent him to Switzerland in 1858; and two years later with his wife and daughter crossed the ocean with the expectation of remaining a year with him. He visited several uncles in Germany and commented to his wife that Germany had not progressed any since he had left it more than twenty years before, and was happy to reflect that his lot was cast in America where all things were progressive.

It is said that children always loved Walter and that in general he held not only the admiration but the affection of his patients. He was fond of all sorts of pets: pigeons, squirrels, dogs, goats and so forth, and for a time carried a pet squirrel in his pocket which was trained to travel up his back, about his neck and then retire to his coat pocket. It was the same emotion in Walter which made him love animals that led him to take a most active part in the affairs of the Humane Society of Pittsburgh, of which he was one of the founders. This Society was organized in 1874 and Walter presided at the first meeting. He said a man who would not be voluntarily kind to animals must be forced to be kind "to obey the commands of heart, of conscience and of God." He said to his associates: "I am ever ready to serve this good cause with all my heart."

ALBERT G. WALTER (1811–1876).

From the early days in his Pittsburgh career, Walter secured accident work from the mills, and his superiority to other surgeons who did such work was so quickly apparent that he soon acquired a national reputation for accident surgery. It is said that Walter's first fee was received shortly after his arrival in Pittsburgh: five dollars payed him by Dr. T. W. Shaw for his services in administering ether to a patient. This he at once devoted to the purchase of a box of the blackest cigars the town afforded.

Walter was a great student. He worked through the day and sat up until the small hours of the night making notes and devising mechanical methods of accident treatment. With German thrift, he was economical to the last degree. His widow for many years kept drawers containing bits of straps, odd buckles, splints and every mechanical device which he used. Mrs. Walter stated that he never destroyed any appliance he had used on a patient. Dr. Albert Pettit, who succeeded to his offices, states that one very large room was lined with deep closets which were filled from floor to ceiling with surgical appliances and casts of all sorts. He personally supervised the making of these appliances at the factory, occasionally hammering them out himself. He kept most accurate records of all his patients, not only those operated upon, but others as well. In his books of case records he criticized his colleagues with utmost candor. No doubt he considered these records private, and he had no hesitation in criticizing severely the treatment of any patient in whose case he had succeeded another physician or surgeon. This same spirit of criticism of his professional brethren which pervaded his records, he carried out in his communication with patients; and this brought him a heritage of hate from most of his colleagues.

Walter's enthusiasm for good surgery and his properly high estimation of his own skill led him to stop patients on the street and ask them who was their doctor and to inform them that they had been improperly treated. It has often been charged that Walter never failed to "play to the galleries"; certainly many of his cases got into the newspapers. In one case a patient was brought up the river on a steamboat, with a surgeon in charge. The man had sustained a crushed leg which had been encircled by a coil of rope. Dr. Walter asked the surgeon who brought the patient, what he thought should be done in the case. The answer was that the leg should be amputated. Dr. Walter replied in a boastful way: "Nonsense, I will save the man's limb." The next day the patient was dead and Dr. Walter had made a lifelong enemy of the surgeon, who afterwards attained some prominence.

Walter at one time implanted peas in the subcutaneous tissues of a patient with tuberculosis of the knee. The peas were said to have germinated, as Walter hoped, but the result was, of course, a failure. The patient, greatly dissatisfied, entered suit against Walter. This afforded an opportunity for many of Walter's surgical colleagues to get even with him and they were rejoiced to testify against him in court. If one wonders why Walter adopted a treatment so obviously foolish, the answer is this: Tuberculosis of the knee was exceedingly stubborn to treatment of all sorts, and in trying out this remedy, Walter was following the recommendation of several of the highest authorities on surgery of his day.

Walter had learned from his old teacher, Dr. Dieffenbach, a new method of correcting deformities of the human body by subcutaneous division of tendons; and this method he at once practiced in Pittsburgh, very extensively and with great success. Indeed, he had already, during his stay in Nashville, done considerable orthopedic surgery, having corrected a number of club feet; and these operations were the earliest, or among the earliest, of the kind performed in America.

Orthopedic surgery, for which his ingenuity and imagination peculiarly fitted him, enlisted Walter's deepest interest. Many plaster casts showing deformed limbs before and after treatment were to be seen in the Museum of the Medical School of the University of Pittsburgh, and they bore silent testimony to his skill, consuming energy and unbounded enthusiasm.

The story is told that Walter, soon after his arrival in Pittsburgh, met on the street a tall Irishman, whose legs were terribly deformed. The doctor persuaded the Irishman to permit him to operate, at first on one leg only, and this proving a great success, the patient was only too glad to permit him to operate on the other leg. Dr. J. P. Gazzam, who assisted Dr. Walter, was profoundly impressed by the success of this operation.

Dr. Walter was a man of fierce courage. He feared nothing or no one. On one occasion, his neighbor, Dr. W. H. Daly, having some grievance against him because of his treatment of a patient, crossed the street and, entering Walter's office, demanded a retraction of the professional slander. Walter picked up a heavy paper weight and was about to strike Daly with it when Daly told him if he attempted to use that paper weight it would be the last act of his life. Dr. H. H. Clark was an eye witness to this occurrence and states that notwithstanding Walter's great courage, he showed his belief that discretion was the better part of valor and laid down the paper weight.

Dr. Clark, who was intimately associated with Walter, studied medicine under him, dressed his surgical patients for three years, kept his books, collected his bills, and was his general factotum, states that notwithstanding his arrogance, his unpopularity, his selfishness in the treatment of other members of the profession, he was the greatest surgeon that ever practiced in Pittsburgh, consideration being given to the limitations of surgical knowledge of that day. Walter's chief aim in life was, in the opinion of Dr. Clark, not the acquisition of money; that while he did like financial rewards, these were to him a secondary consideration. He was consumed with interest in, and love for, good surgery; and it was this thing that made him so impatient of much of the surgery he saw about him and the producers of it. His disgust and contempt for many of the surgeons was very deep and generally outspoken. He did not hesitate to advise people to bring malpractice suits and often testified in court in such suits, although he complained bitterly when such suits were brought against him. In short, Walter more or less questioned the right of anyone else to practice surgery in the town, but this feeling was not extended to physicians who confined their labor to medicine.

Walter established a private hospital in a building which still stands on Bluff Street, near Duquesne University. Dr. Charles Emmerling, with his wife and several children, lived in this hospital for a short time while he and Walter were in partnership. This arrangement was of short duration: Dr. Emmerling found the place too cold and uncomfortable for himself and family and the arrangement uncongenial.

THE BUILDING IN WHICH DR. WALTER CONDUCTED HIS PRIVATE HOSPITAL.

Walter's medical career in Pittsburgh was one of great activity; the story of his skill, energy, resourcefulness and versatility must draw from the reader, even at this date, a tribute of homage and admiration for this great man. He published many magazine articles and two notable books, in one of which, "Fractures of Bones," he advocated the use of silver plates, far in advance of his time. Another, entitled "Conservative Surgery," was published in 1867. This work he dedicated to S. D. Gross of Philadelphia and James Syme of Edinburgh. It is to be noted that Walter's contributions were made to the foremost journals of the day, among them being the *British Medical Journal, The Medical and Surgical Reporter* and *The American Journal of the Medical Sciences,* the first of these published in 1857 and the last a year after his death, in 1877. It will be seen that he clearly recognized the fundamental necessity for cleanliness in surgery; he was fully ready to appreciate Pasteur's and Lister's work and, indeed, to act upon it. It is not too much to say that, had Walter lived, aseptic surgery would have been introduced in Pittsburgh and become general twenty years before it actually did come into general use.

His ingenuity, courage and skill are well revealed in a report entitled "Arthoplastic Operation upon both Femurs below the Great Trochanter."[4] Walter reviews the literature on the subject and then reports a case as follows:

"Patient was a man of 31 years of age, who from the tenth year suffered from ankylosis of both hip joints, the femurs being fixed at right angles to the pelvis." By operation (July, 1875) Walter created an artificial joint below the hip joint. After the first operation "very free suppuration occurred and continued for two or three weeks, but eight weeks after the operation the patient had completely recovered. Operation was performed on the other leg September, 1875." In June, 1876, the condition of the patient was very favorable: "He is able to get out of bed without assistance and can stand upon his feet and walk with crutches better than ever." The paper was accompanied by an interesting photograph.

Walter refers[5] to the reports of his first case of true bony ankylosis, in which he had "opportunity to save and relieve, by removal of a section of the trochanter major."

Walter's versatility as a surgeon is at once revealed when it is realized that he was one of the earliest pioneers in America in the field of orthopedic surgery, a skilled oculist, and a most resourceful general surgeon. It is said that, up to the time of his death, he had cut more tendons in one patient than any other living surgeon. His fame as an accident surgeon was nation-wide.

But Walter's chief claim to distinction is the epoch-making laparotomy which he performed for the relief of ruptured bladder, the patient making a good recovery. Walter is generally credited as having first performed this operation and as his report is one of historical interest, liberal quotations are made from it as it appears in the *Medical and Surgical Reporter* of November 16, 1861.

CASE OF RUPTURE OF THE BLADDER, TREATED BY ABDOMINAL SECTION

John Borland, 22 years of age, blacksmith by trade, of healthy constitution, and strong muscular development, was kicked during a fight, on the lower part of the abdomen, on January 12, 1859. Immediately on receipt of the injury, he became weak and faintish, complaining of violent pain in the region of the bladder. Some hours later, being called to see him, I found the following condition of the patient: The abdomen, without showing any marks of external violence, was somewhat swollen and exquisitely tender to the touch, more particularly over the pubis, where the injury had been received. His pulse was quick and small, skin cool, respiration short and rapid, incessant were the painful calls at micturition with inability to discharge urine. There was vomiturition and vomiting, at first the contents of the stomach, afterwards a slimy, bilious fluid was ejected. On the introduction of a catheter, some bloody urine was drawn off without any relief of abdominal pains, or the constant urging calls to make water. These being the symptoms, no doubt was entertained that the bladder had been ruptured by the violent blow from the point of the foot, and that urine had extravasated in large quantities into the abdominal cavity (the patient having been in the habit of retaining his urine for a long time, and in the present instance for more than six hours). . . .

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[4] *Arch. Clin. Surg.,* Aug., 1876.

[5] *Am. J. Med. Sc.,* Apr., 1859, XXXVII.

Ten hours after the receipt of the injury, assisted by Dr. Guenste chloroformisation having been induced, the abdomen was opened in the linea alba by an incision, beginning one inch below the umbilicus, and terminating about one inch above the pubes, to the extent of six inches. The intestines were found inflated, their peritoneal coat, as well as that lining the interior of the abdominal walls already showed marks of congestion. A soft sponge then cautiously introduced into the abdomen, with which the extravasated fluid, consisting of urine and blood, was carefully removed from the pelvis, and between the convolutions of the bowels, amounting to near a pint. While thus inspecting the abdominal cavity, a rent was found in the fundus of the bladder of two inches extent, through which the urine had escaped. The cavity of the abdomen being cleansed of the noxious agent, the wound of the bladder was left to itself, as no urine was seen to escape from it. The abdominal wound was closed by strong Carlsbad needles, secured by silver wire (only skin and fascia being stitched, while the peritoneum was left untouched). A flannel bandage encircled the whole abdomen. The patient awakening out of the anesthetic sleep, felt relieved of pain and desire to urinate, so distressing before the operation. Vomiting did not return. Opium again in one grain doses every hour was ordered. Abstinence from drink and perfect quietude of body, with retention of the catheter, were strictly insisted upon. He soon began to doze, had a comfortable night, was free from pain the next morning, complaining only of soreness of the abdomen, without tampanites, sickness or calls to urinate, thirst less urgent. . . .

At the expiration of two weeks, with the absence of all pain and tenderness, opium was omitted. The intestines were relieved by warm water injections on the tenth day, when mild nourishment was ordered. Between the second and third week the catheter was permanently withdrawn, and only introduced every four hours for the evacuation of the urine. After the third week, the patient left his bed, feeling restored to health and drawing off his urine himself every four hours. He has remained well every since, working at his trade, and feeling no impediment in his urinary organs.

In this clear and simple manner, Walter records an operation performed in 1858 which was to be epoch-marking. For the first time in the history of surgery, an intact abdominal wall was opened for the treatment of ruptured bladder. The Nestor among Pittsburgh surgeons of today, Dr. John J. Buchanan, commenting on this report, calls attention to the fact that while modern methods require intraperitoneal suture of the bladder, Walter deliberately refrained from such suture. His suture did not include the peritoneum, the reason being that at that time suture of the peritoneum was considered a dangerous procedure.

Dr. J. B. Murdoch, in his presidential address before the State Medical Society in 1890, says: "In 1858, when there was no precedent for such procedure, he boldly cut open the abdomen, washed out the peritoneal cavity, drained the bladder by a catheter retained in the urethra. The patient recovered. This operation was not repeated until eighteen years later and is now recognized as the proper treatment for such an injury."[6]

The *Pittsburgh Dispatch* of November 8, 1886, contains a cable from London describing a remarkable operation performed by Sir William MacCormac of the Royal College of Surgeons: "It is believed there are no previous instances of success of such an operation in Europe or America." The cable goes on to state that Sir William MacCormac diagnosed the patient's condition as rupture of the bladder. He then made an incision into the abdomen and verified the diagnosis. The bladder was drawn out and sutured. The patient made a good recovery.

At the meeting of the Allegheny County Medical Society in February, 1887, the Committee on Intelligence reported Sir William MacCormac's two cases of successful abdominal section for intraperitoneal rupture of the bladder and commented upon the novelty of the operation as follows: "Within a stone's throw of the building in which the Society sat, stands the house of the late Dr. Albert G. Walter, who twenty-five years ago opened the abdomen of a man with ruptured bladder with success and reported the case in the *Medical and Surgical Reporter* for that year, 1861. It is the first authentic case of the kind in the history of surgery."

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[6] *Pittsburgh Med. Rev.*, July, 1890.

In the *Journal of the American Medical Association*, February 26, 1887, Dr. Thos. S. K. Morton, in a paper on "Abdominal Section for Traumatism," speaks of Dr. Walter as the pioneer in this work, and the correspondent of the *Medical Record* writing from London, under date of February 5, 1887, commenting on the cases that were the subject of the report of the Allegheny County Society, gives Dr. Walter the credit justly due him. Truly, "A prophet is not without honor save in his own country."[7]

In the preface of his work on "Conservative Surgery" Walter says:

> Having ardently and almost exclusively engaged in the profession of Surgery, to which more than thirty years of faithful labor, in public and private practice, have been devoted, in a locality, too, where accidents and injuries caused by machinery were unusually frequent, the author, in treating *these* cases, soon became convinced that the efforts of *Nature* at salvation and restoration, in injuries, especially in those of a grave character, and *her* conservative aims, on which the surgeon alike as the physician, has mainly to rely, in order to lead the case to recovery, has, alas! been too often either overlooked, or plainly misunderstood.

The plan advocated by Walter is sufficiently revealed by the following quotations from his opening chapter:

> If conservation be attempted, that, *first* of all, *free vent* must be given by *long* and *deep* incisions, for the escape of effused blood confined under the fascia, between muscles, and in the cellular tissues of the skin, and that all attempts to bring the soft parts together, when lacerated or cut, by stitches, be *strictly* and absolutely discarded.
>
> A limb, thus injured, should be placed, without delay, in its whole length upon a well cushioned sheet-iron or tin splint, and the detached pieces of bone followed by resection of their shattered extremities—if splintered, very obliquely fractured, or extensively denuded of periosteum—removed. The *wound* should then be freely enlarged (slitting up skin and fascia) or, if no breach of surface should exist, but more bruising and swelling be present, indicating the extent and severity of the injury, a free incision in the long axis of the limb should at once be made through dermis and fascia, which will liberate the muscles, blood vessels and nerves, from the pressure of blood effused in the areolar meshes of the different tissues, and give relief to the subsequent swelling of muscles, and extravasation of serum, which always follow in the course of such injuries, with gangrenous destruction of the skin and fascia superadded.
>
> *Free, deep and early* incisions, (the more timely made the better) are I aver, the *only* measures deserving the name *conservative*, in injuries of this character. Next to them, *warmth*, by warm water dressings (medicated or simple) or by poultices, promptly and assiduously applied, is claimed as an important adjunct. Under its genial and soothing influence, the feeble vitality of crushed and mangled limbs will be roused, local arterial circulation excited and revivication induced, venous congestion relieved, elimination promoted, and suppuration, with cicatrization expedited. Cold applications, under these circumstances, cannot fail to extinguish the quivering sparks of life which are left in the member, and hasten its destruction.

Enthusiasm and great, earnest and deep conviction of the author are well revealed in these brief paragraphs from the opening chapter:

> Many, very many are the limbs and lives that might have been saved, if due weight had been given to the incontestible fact, that the *unyielding* nature of the *fascia*, which envelops the muscles and supports them for the performance of their functions, is the main source of danger to the injured limb, and that free division of aponeurotic structure, in all severe injuries, occasioned either by shot or any other crushing power, is the only *safeguard* to limb and life of the wounded.

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[7] *Pittsburgh Med. Rev.*, March, 1881.

Then follows a recital of a large number of cases in which the author illustrates many times over the method of treatment which he so eloquently advocates. The cases are not numbered as they would be in works of today, but they are designated with full, and presumably real, names of the patients. The description of patient and injury are brief and quaint, as shown by the following few examples:

> Felix Holler, of Pittsburgh, aged fourteen years, a healthy and well formed boy, while seeking shelter under a warehouse in course of erection, on July 26th, 1850, during a heavy thunder storm, was buried by a mass of brick which fell upon him from one side of the building caving in.
>
> John Carson, aged thirty years, merchant, on December 26th, 1851, fell through the hatchway of his store, upon the floor below, during a bitter cold night while in an intoxicated condition, and remained there, helpless, for four hours, exposed to intense frost, before he could be removed to his room.
>
> Philip Smith, aged twelve and a half years, of Coal Hill, Upper St. Clair Township, Allegheny County, Pennsylvania, of slender frame and bilious temperament, was severely injured, on June 3rd, 1854, while at work in a coal-pit, by heavy piece of slate falling upon him.
>
> Christian Reber, aged twenty-three years, puddler by trade, very tall, slender and healthy, of bilious habit and nervo-sanguineous temperament, on October 17th, 1855, while engaged at his furnace in a rolling mill, in West Pittsburgh, was struck on the black part of the right leg by a large piece of rock thrown from a hill in the rear of the works, which was being removed by blasting.

After describing his clinical cases, Walter proceeds to notice the methods lately proposed by Joseph Lister of Glasgow, Scotland, for the treatment of wounds and injuries, which were influenced by the theory of minute organisms of Pasteur. He tells us that Lister thinks he has found in carbolic acid an agent which can protect the wound from germs floating in the air and that this acid acts as an antidote; the theory is supported by James Syme and other eminent European authorities.

Notwithstanding the fame of these two men, to one of whom his book is dedicated, Walter proceeds to argue against the carbolic acid spray as an application of this theory and to set forth his own views in the following significant language. It will be observed that Walter argues, not against the germ theory, but against the method of procedure to combat germs which was then in vogue and which is now obsolete, and that he was again ahead of his time in arguing for the great value of sunshine and fresh air and for cleanliness.

> *Pure* air, therefore, I have no hesitation in declaring, is not only harmless, but priceless to man, and to all the rest of creation, whether in a healthy or an afflicted condition. Like the rain drops descending from the great laboratory of heaven—the air, sweet, pure and healthful—is refreshing, invigorating and gladdening to all the inhabitants of this beautiful globe. Its free and unrestrained access to wounds and injuries, then cannot be the cause of these direful complications—erysipelas, phlegmon, gangrene, phlebitis, or pyaemia—which are known to ensue in so many cases.
>
> *Poison mingled with the air*, then, and not *pure* air, is the enemy the surgeon has to contend with in the management of surgical injuries, whether in hospitals or in other unhealthy localities; the only antidote for which, and the only method of averting its injurious effects on wounds, and on the system at large, being the prompt removal of the patient to a place free from all contaminating influences.
>
> This appears to my mind a reasonable and logical deduction, which ample experience, revealed in previous pages, has strengthened. The view of this subject here taken, I feel gratified to state, is shared by Mr. Canniff of Canada who in the *Canada Medical Journal* of a late date made some excellent remarks regarding Prof. Lister's practice.

Walter's closing words are sad enough:

> Having devoted years of study and toil to the salvation of limbs severely, nay, almost hopelessly injured, which but for the conservative practice I advocate, would have been maimed, I cannot deny the gratification I feel in thus being enabled to add one more laurel to the brow of

Conservatism—bright, enduring and priceless as any she wears.

If saving the limb or life of the humblest citizen, by unusual efforts deserves commendation, the principle and practice by which a *whole class of injuries* is rescued from mutilation, danger and death, certainly stands unrivaled. This principle and practice it has been my aim to establish; and that I have succeeded cannot in candor be denied me. Though cherishing it as a great boon to the unfortunate patient, worthy of being promulgated, I do not claim credit; but conscious of having contributed my mite for the relief of the maimed, I would consider myself derelict in duty by withholding its publication.

That my humble, laborious and protracted exertions, devoted to a noble cause should have provoked aspersions and detractions, in special quarters, however, is not to be wondered at. But having succeeded in my efforts, with the result laid open to professional scrutiny, I can well afford to be charitable to those of the profession, who, unwilling to investigate, seek renown only in mutilation and destruction. With such I hold no communion. To the intelligent surgeons alone, I offer these pages and invoke them as judges of the merits.

The lessons to be drawn from the life of Walter are, for the most part, obvious. His faults were open and glaring: he was intolerant and greatly lacking in consideration for his colleagues and he was highly egotistical. But, on the other hand, he was a man of remarkable talent and marvelous industry, a genius. It was his love of surgery and his ability to do it well, combined with his driving energy, that made him impatient and blinded him to the rights of colleagues, and so led him to fail to conform to professional etiquette. True, his criticisms were generally well taken, for surgery in Walter's day was for the most part badly done; but it is to be deplored that they were not more tactfully expressed. Had he possessed the qualities of leadership, he might have had the profession solidly behind him, for he is easily the outstanding figure in the medical annals of Pittsburgh and indeed his life stands out as a great beacon light in the surgical history of the United States. So in viewing the life of this great pioneer in surgery, let us with the mantle of charity cover his faults, remembering only his legacy to suffering humanity.

WILLIAM WALLACE

A young man of great promise, but of short though brilliant career, was Dr. William Wallace, son-in-law of Dr. Walter. He was born in Allegheny, August 22, 1851, received his degree at the St. Louis Medical College in 1870 and died in Pittsburgh August 25, 1883.

JOSEPH ALLISON REED

Dr. Joseph Allison Reed was born in Washington, Pennsylvania, December 31, 1823, and was graduated with the degree of A.M. from Washington College in 1842. In 1847 he received his degree of M.D. from Jefferson Medical College and at once commenced the practice of medicine in Allegheny. In 1857, when the insane department was divorced from the medical and surgical department of the Western Pennsylvania Hospital, largely through the labors of Dr. Reed and Miss Dorothea L. Dix, Dr. Reed was placed in charge of Dixmont, where he gave twenty-seven years of his life to the amelioration of the pitiful condition of the insane. Dr. Reed was known throughout the country as an authority on the subject of insanity and he was frequently called by the Government, both state and national, to aid in proper legislation for the care of the insane. His contribution to the literature of insanity was varied and valuable. He died November 6, 1884.

Dr. Reed is the father of Judge Reed, a distinguished jurist of Pittsburgh, who in turn is the father of David Reed, at present one of the United States senators from Pittsburgh.

THOMAS GALLAGHER

Dr. Thomas Gallagher, born in 1822 in Indiana County, Pennsylvania, graduated from the University of Pennsylvania in

1849 and practiced medicine in Pittsburgh for nearly forty years. In connection with his son, Dr. R. C. Gallagher, he edited the *Pittsburgh Medical Journal*, the first effort at local professional publicity. Dr. Gallagher made many valuable contributions to medical literature. He was a laborious and enthusiastic student, a conscientious and successful practitioner and an honest man.

JAMES KING

James King, Pittsburgh, son of John King, iron-master, was born January 18, 1816, in Bedford County, Pennsylvania. He was educated at the Bedford Classical and Mathematical Academy and studied medicine in Lexington, Kentucky under Dr. Benjamin W. Dudley, subsequently entering the medical department of the University of Pennsylvania, from which he was graduated March 14, 1838. He began practice at Hollidaysburg, Pennsylvania, whence in 1844 he moved to Washington, Pennsylvania, remaining there about six years and filling during a portion of the period the chair of anatomy in the Washington College. This he resigned on account of ill health and in 1850 removed to Pittsburgh. At the outbreak of the Civil War, he entered the United States Army as surgeon at Camp Curtin, as division surgeon of the state, and as medical director of the Pennsylvania Reserves, which last position he held until the battle of Antietam. After this battle, at the request of Gov. Curtin, he was mustered out of the federal service to become surgeon-general of the state, holding this latter place until August 1, 1864, when he resigned and resumed his practice in Pittsburgh. He was, it may be added, a member of the first examining board organized by his predecessor in the office of surgeon-general and in his own discharge of the office did much to systematize its regulations and improve its management, not to mention his official reports, the style and method of which so commended themselves to the surgeon-general of the sister state of Ohio that he took the report as a model. He was president of the Allegheny County Medical Society in 1866.

A list of physicians practicing in Pittsburgh in 1853 furnished by Dr. A. M. Speer, contains the following names in addition to some of those mentioned: Fahnestock, Shepley, Holmes, Edrington, Robert Simpson, Walter Murdoch, Cahill, Dorsey, Wilson, McCook, Sr., McCook, Jr., Snyder, Morgan, King, Brackenridge, Hazlett, Reynolds, Cross, Sr., Cross, Jr., Dillworth, Trevor, Irish, Tober, Gallagher, Mackey, Hallock, Shaw, Tindle, Pollock, Speer, Bruce, Hammersley, McCracken; and in Allegheny, J. B. Herron, William Herron, John Dickson, Thomas Dickson and Reed.

PHYSICIANS OF PITTSBURGH FROM THE MIDDLE OF THE NINETEENTH CENTURY TO THE PRESENT DAY

Since it is the purpose of the author to record the earlier, rather than the later, history of medicine he makes only brief mention of physicians from the middle of the nineteenth century to the present time. More extended biographies of the names mentioned may be found in monographs by Dr. C. R. Jones and Dr. T. D. Davis.

Dr. E. A. Woods was a most versatile physician, one of the founders of the Medical College.

Dr. Andrew Fleming was born in Pittsburgh in 1830 and studied under Dr. Gazzam. He was an accomplished gentleman and was one of the first to advocate the establishment of a medical school in Pittsburgh.

Dr. Thomas Mabon and his son, John Mabon, and the latter's son, Thomas Mabon, constitute one of the medical families of distinction of this section.

Dr. Cyrus B. King, on account of his splendid personality, his interest in surgery, in the West Penn Medical College and his long service on the State Board of Charities won for himself a high place in the records of the medical profession.

Dr. Silas N. Benham was born in Washington, Pennsylvania, in 1840 and served as surgeon during the Civil War. He helped organize the Pittsburgh Dispensary.

Dr. James McCann, of Scotch-Irish ancestry, was born in Allegheny County in 1837 and became a surgeon of the first rank. He was largely instrumental in organizing the Western Pennsylvania Medical College.

Dr. A. M. Pollock settled in Pittsburgh in 1871 and led a long active and useful life.

Dr. James B. Murdoch was born in Glasgow, Scotland in 1830 and died in Pittsburgh in 1896. He practiced medicine in Oswego, New York, until 1872 when he removed to Pittsburgh and practiced until his death. He was one of the founders of the Western Pennsylvania Medical School and author of several important monographs. He practiced and advocated the torsion of arteries.

Dr. Thomas Wilson Shaw was born in Glenshaw in 1826 and was in active practice for nearly fifty years.

Dr. Charles Stoner Shaw, son of Thomas W. Shaw, was born in 1856 and graduated from the University of Pennsylvania in 1879. He died in 1899.

Dr. Shaw was a man of high ideals and stood for all that is best and highest in the medical profession. With a view to do battle in its cause and to stimulate the observance of the code of ethics, the more especially as to its bearing on nostrum advertising in the medical press, he with some half dozen others of the younger physicians of Pittsburgh, organized in December, 1885, *The Pittsburgh Medical Review*, a monthly periodical owned and controlled entirely by the editors. Dr. Shaw was recognized as editor-in-chief of this publication and under his vigorous efforts, directed especially at the *Journal of the American Medical Association*, the board of trustees of that journal gradually eliminated the more obnoxious advertisements until its pages were practically freed from all those which the code of ethics forbids. His contribution to medical literature partook largely of the nature of editorials together with papers on general medicine and pediatrics.

Dr. James A. Lippincott was born in Nova Scotia in 1840. He is a man of singular charm and large learning. He entered the field of ophthalmology and attained nationwide reputation.

Dr. X. O. Werder was born in Switzerland in 1857 and was one of the first in Pittsburgh to make a specialty of gynecology, in which he attained a high position.

Dr. Eugene Matson was born in Brookville, in 1858. He was a man of high scholarly attainments, of philosophic attitude of mind, modest and idealistic, ever striving for the advancement of medical science and the better things in life. He was unmarried and alone and gave his entire thought and energies to the science which he loved. His influence was a strong element in conquering the incidence of typhoid fever, whose endemic and annual epidemics, during the early years of his professional life, demanded hundreds of victims annually in the cities of Pittsburgh and Allegheny. His activities and influence in establishing the filtration plant, which put an end to the typhoid fever plague in Pittsburgh, were unceasing and thus aided in saving many valuable lives annually. He was universally esteemed and admired for his qualities of mind and heart and his untimely death was mourned by all who knew him.

Dr. Robert Wray Stewart was born in 1861. He reorganized the surgical staff of Mercy Hospital in 1890. His career began with the era of antiseptic surgery and he was quick to recognize the value of this contribution to surgical technique.

Dr. W. H. Daly was the first physician in Pittsburgh to make a specialty of throat diseases. He was widely travelled and a man of most congenial habits; so that he was not only an agreeable colleague but a delightful companion. His name was associated with considerable notoriety on account of the exposure of the beef scandal which developed during and after the Spanish-American War.

Another notable physician of this time was R. Stansbury Sutton, who was a pioneer figure in gynecology in Pittsburgh. Dr. Sutton was full of enthusiasm and zeal. He was somewhat lacking in tact and a sense of humor and every now and then he and his friend Dr. Daly would have a little tilt, more or less amusing to their friends.

Dr. Karl Emmerling exemplifies in the finest way the skill, integrity and patient perseverance and resourcefulness which belongs to the practitioner of the old school. He worked with indefatigable industry to an advanced age, leaving behind him a record which is a credit to himself and the whole profession. He may be called an ideal general practitioner.

Drs. Thomas, Duff and Huselton are also contemporaries of these men whose names deserve recording because of their fine achievements.

EARLY PHYSICIANS LOCATED NEAR PITTSBURGH OUTSIDE ALLEGHENY COUNTY

Reference has already been made to Dr. Joseph Doddridge, Dr. Cephas Dodd and Dr. Jason Jennings who ministered to both the souls and bodies of men, none of whom practiced in Pittsburgh. The career of Dr. John Knight of Fayette has also been recorded as well as those of members of the Marchand and LeMoyne families.

Uniontown, Fayette County, situated at the foot of the Western slope of the mountains and on the line of Braddock's route, in the midst of an excellent farming district, attracted early settlers, with whom came a pioneer physician in the person of Dr. Samuel Sackett. He had been surgeon in the American Army and came west from Connecticut in 1781. He was in active practice in the vicinity of Uniontown about forty years and died in 1833.

About four years earlier than this Dr. Henry Moore was practicing in Buffalo township, Washington County. The incident of his trepanning the head of a little girl whose skull had been fractured by an Indian is recorded. He died in Washington, Pennsylvania.

Dr. John Postlethwait was born in Carlisle in 1776 and graduated from the College and University of Pennsylvania. Having travelled westward with the expedition sent to curb the whiskey insurrection, and being delighted with the region, he crossed the mountains after his medical education was finished in 1797 and located at Greensburg where he practiced until his death in 1842.

Dr. John Culbertson Wallace was the first resident physician at Erie. He was a native of Harrisburg and graduated in medicine at the University of Pennsylvania. In 1796 he accompanied General Wayne in an expedition to Fort Wayne, Indiana, as surgeon. He afterwards practiced his profession three years in Franklin and thence moved to Erie. He rose to prominence, commanded an Erie County regiment at the beginning of the War of 1812 and died in 1826, leaving no family.

Dr. T. G. Symonds settled in Franklin in 1800. Nothing is now known of his subsequent career. For some time the county (Venango) was without a physician, after which period Dr. Thomas Smith settled there and administered to the sick of that immediate period.

Dr. John Knight settled in Fayette County in 1776, as has already been noted. Dr. James Francis settled there on a farm in North Union Township in 1789 and died greatly honored in 1813. Among his students were Dr. Benjamin Dorsey, Daniel Sturgeon, Dr. Wilson and Dr. Wright. Daniel Sturgeon was a graduate of Jefferson College and succeeded to the practice of Dr. Stevens. Dr. Young was another early physician of Fayette County and also kept a stock of drugs for the public. Dr. Jesse Pennell practiced for a period of years in Bridgeport, Fayette County, but died in 1818 of typhoid fever, which was then epidemic in that county. Dr. Adam Simonton came on from the east before 1795 and practiced in Uniontown until his death in

1808, respected and loved by his community. The career of that notable pioneer physician, Dr. Doddridge, has already been narrated.

Passing into Washington County, it is found that Dr. Absalom Baird studied with Dr. Gardner Scott of Chester County, who raised a company of volunteers for the Revolutionary army of which Dr. Baird became a member, and was soon afterwards appointed assistant surgeon in a Pennsylvania regiment. Towards the close of the war he began to practice in Kennett Square, Chester County, and in 1786 removed to Washington, Pennsylvania, where he was killed by falling from a horse in 1805. Dr. Jacob Green was a physician in Springhill Township, Washington County, but little is known of him except that his name appears on the tax roll of 1786. Dr. Hugh Thompson was an early settler in Peter's Township, Washington County, where he was a large land owner and long in practice. Dr. Alex Gaston practiced in Canton Township, Washington County, many years and then removed to Ohio. Dr. John Culbertson settled in Washington, Pennsylvania, in 1784 but soon removed to Independence Township, where he practiced more than thirty years.

EPIDEMICS

As might be readily expected, Pittsburgh, with its lack of sanitary arrangements, was subject to contagious disease, and we must in this place record several epidemics which visited the town from time to time.

Cholera

In 1832 the Asiatic cholera made its appearance in Philadelphia and New York, and occasioned great alarm in Pittsburgh. In June, 1832, the ministry of Pittsburgh assembled and recommended a day of fasting, humiliation and prayer "that God avert the danger threatening the country from Asiatic cholera." The city authorities passed ordinances for a rigid enforcement of sanitary measures. Drs. James Agnew, Adam Hays and James Speer, A. R. Holmes and H. D. Sellers were appointed consulting physicians to the Sanitary Board of which Samuel Pettigrew was president and E. J. Roberts, secretary. At this time the Sanitary Board had not been incorporated and was functioning only by appointment of the city council. Dr. Jonas R. McClintock was appointed physician: Steps were taken to reörganize the Sanitary Board and to establish a temporary free dispensary. Concert Hall on Penn Avenue was engaged for the latter purpose. Appropriations were made to put the city in the best possible condition to fight this infection.

On October 22, 1832, a negro from Cincinnati died of cholera in Pittsburgh and the infection began to spread in spite of the utmost exertions of the physicians and the city authorities. By the twenty-sixth, five cases had appeared and three deaths resulted. During the next two months from twenty-five to thirty-five persons died but the scourge was then checked. In May, 1833, it reappeared, although rigid and systematic precautions had been taken in its prevention. From May to June 25 there appeared seventeen cases, of which five were outsiders, and by July 1 eight deaths had occurred. The epidemic seemed to have gained a strong foothold by this time, as it was stated in the newspapers of July 5 that twenty-three residents and five outsiders had died. Dr. John Speer was very active and prominent as the hospital doctor at this time. Trouble arose between the practicing physicians and the Sanitary Board. In the autumn of 1832 the latter accused the former of neglecting to report cases of cholera which they encountered in their practice and repeated the accusation in 1833. In July Drs. J. D. Gazzam and E. D. Gazzam said: "Since the recent reappearance of the disease in Pittsburgh 36 cases of fully developed cholera have occurred in our practice. Of these, six cases are now remaining, five of which are convalescing and one doubtful. So far as our observation and experience extend the disease as yet is more manageable and more easy of cure than it was last fall."

The Board of Health pursued a course which was condemned by reputable physicians. In the autumn of 1832 the Gazzams reported a case and ordered the patient to the hospital. The Sanitary Board refused to accept the judgment of the physicians, using unnecessary and unjust measures in their observations and sent the health physician to examine the case and report thereon. The latter states that it was a case of common cholera (morbus) whereupon, although five other reputable physicians corroborated the Gazzams' diagnosis, admission to the hospital was refused. This act roused the physicians, and thereafter they refused to report cases of cholera coming under their practice. They were sharply criticized by the Board of Health, whereupon Dr. Gazzam replied as follows: "We are not and never have been indisposed to give the public every information in our power in relation to the epidemic, but we cannot consent to modify, change or pervert our deliberate opinions respecting its true nature to gratify popular prejudices or to suit the crude and various notions of those who have no knowledge of the subject; nor can we consent to submit again our medical opinions or reports to the judgment and supervision of such tribunals."

In June, 1833, the churches observed a day of fasting, humiliation and prayer "that God would end the plague or pass it by Pittsburgh." Hydrants in all parts of the city were permitted to run one hour each day to cleanse the walks, gutters and streets. The building of the temporary hospital this year cost $400. Thomas O'Neal was superintendent of the Hospital; Drs. Armstrong and Brude were hospital physicians, and Dr. Jonas McClintock health physician. The *Gazette* said of the disease: "Wheeling, Maysville and Lexington, with a population not exceeding 18,000, lost more persons in a single day than Pittsburgh and vicinity lost by the same disease (cholera in two years and two separate visits of the scourge). An experienced physician assures us that he has never seen a genuine indigenous case of that loathsome disease, the itch, since he came here and that cholera infantum does not prevail to one-tenth part of the extent in other towns East and West. By the report of the health physician it appears that 44 deaths by malignant cholera have occurred in this city and neighboring boroughs and villages since the end of May." It is impossible to give the exact number of cases of cholera or the exact number of deaths because the newspapers deliberately suppressed the extent of the scourge and no other record is known to exist. Business was seriously interfered with, in fact was almost at a standstill, while the epidemic lasted. Probably a total of over one hundred cases were reported and seventy-five deaths occurred in 1833.

In 1848 the cholera again visited Pittsburgh. As before the newspapers suppressed the extent of the scourge. Business was wholly suspended and not a countryman could be seen on the streets. The *Commercial Journal* declared that little attempt had been made to clean the gutters and alleys. After from thirty to fifty people had died in Pittsburgh it suddenly broke out in Birmingham with such virulence that from August 11 to August 21 inclusive, eighteen deaths resulted and the people became terror stricken. Many temporarily retired to rural districts. Later Allegheny was visited and in the one day ending at six o'clock in the evening of August 27 ten persons died. In a short time the deaths in Allegheny numbered forty to fifty. It first appeared in Pittsburgh and then Birmingham and then Allegheny and other portions of this community. It is probable that from one hundred and fifty to two hundred persons died of the epidemic in 1849. In 1851 it again appeared but was vigorously confined and not as many deaths resulted. About this time Dr. J. J. Myers was appointed by the Secretary of the Treasury, hospital physician of the Marine Hospital. In 1854 this community was again visited by cholera and the dreadful scenes of the former visitation were enacted with much greater mortality. Again the newspapers, through business motives, suppressed the extent and details of that memorable summer and fall. How many died cannot be learned, but the number approximated one thousand.

Smallpox

During the winter of 1845 many cases of smallpox appeared. Part of the old waterworks was fitted up for the reception of poor patients by the Directors of the Poor. The building was originally used as a coal shed and was walled up into one room, in which were placed eight or nine beds and in one corner a stove, table and utensils, and so forth. The surroundings were poor, but the room was cheerful and comfortable. Aside from the rude temporary hospital of 1833, this was Pittsburgh's first structure for the care of the indigent sick. It was closed during the summer of 1846, but was opened again in the fall for the reception of patients.

Typhoid Fever

In common with many other large cities, Pittsburgh had for many years a high death rate due to typhoid fever. This subject was argued for years and finally resulted in the erection of a filtration plant, from which time dates a very striking reduction of the death rate from typhoid fever. A large share of the credit for this sanitary reform belongs to the *Pittsburgh Medical Review* and its editors, especially Charles S. Shaw, Eugene Matson and Adolph Koenig.

MEDICAL SOCIETIES

The first mention of a medical society which I can find is that of the Western Medical Society, organized in 1814.

The Pittsburgh Medical Society was organized in June, 1821, and in 1822 Dr. Joel Lewis, who had been in practice eleven years, was elected its second president.

June 24, 1826, the fifth annual meeting of the society was held and the following officers elected: president, William Church; vice president, W. H. Denny; chairman, Felix Brunot; corresponding secretary, John S. Irwin; recording secretary, Henry Hammen; treasurer, W. F. Irwin; librarian, John R. Speer; curators, Drs. Wray and Denny Speer.

Among the most active members of the Pittsburgh Medical Society in the early twenties was L. Callahan, who after practicing a short time returned to Europe, where he studied for three years. Upon his return to Pittsburgh he was a very learned man and "was licentiate of the faculty of Physicians and Surgeons and member of the faculty of Medicine of Glasgow." In 1821 he read a paper before the Pittsburgh Medical Society in which he contended "that those kinds of fevers usually denominated contagious fevers had their origin in the places where they broke out instead of being imported. In the first place, I would ask the medical philosopher whether or not he had ever seen pure typhus fever prevail as an epidemic where the exciting and predisposing causes were not present on the spot, either in the surrounding atmosphere, the habitudes of the people, their regimen or the privations to which they were exposed? I would confidently expect the answer must be 'No.'" At a subsequent meeting he read articles on "The Use of Hydriodate of Potash in the Treatment of Goitre," "Observations on Inoculation and Vaccination." During the winter of 1829–1830 he delivered a course of lectures by special invitation on the subject of anatomy before one of the literary societies. His practice, as announced, was "Physic, Surgery, and Midwifery."

Dr. Callahan contributed articles on medical subjects to local newspapers.

The Pittsburgh Medical Society in June, 1829, formally resolved to aid by precept and example in suppressing the vice of intemperance.

Allegheny Medical Society

Pursuant to call, several of the physicians of Pittsburgh and Allegheny met in Philo

Hall August 17, 1848, to consider the propriety of forming a County Medical Society as a branch of the State Medical Society. Dr. Dilworth was made chairman and Dr. Pollock, secretary. On motion of Dr. Dorsey, a committee consisting of Drs. Dilworth, Reed, Gray, Dorsey and Pollock was appointed to arrange for a general meeting of the physicians of the county to organize such a society. Drs. Irwin, Pollock and Bruce were appointed to draft a constitution and by-laws.

The Allegheny Medical Society held its regular quarterly meeting in Arthur's Hall on Tuesday, January 3, 1854. Here the annual election of officers took place, when the following gentlemen were chosen for the ensuing year: president, Dr. C. L. Armstrong; vice-presidents, Drs. J. P. Gazzam and John McCracken; corresponding secretary, Dr. A. M. Pollock; recording secretaries, Drs. T. J. Gallagher, E. G. Edrington and G. D. Bruce; examiners, Drs. J. P. Gazzam, A. M. Pollock, D. McMeal; delegates to the National Medical Convention, Drs. J. P. Gazzam, Thomas J. Gallagher, George D. Bruce, A. M. Pollock, George McCook; delegates to the State Convention, Drs. D. McMeal, W. Draine, J. Carothers, J. McCracken, E. F. Williams, J. H. Wilson, T. W. Shaw, N. McDonald, J. H. O'Brien. The following is a list of the members of the Society in 1854:

C. L. Armstrong, William Addison, G. D. Bruce, H. R. Bell, Alexander Black, H. H. Brackenridge, James Carothers, John Dickson, Thomas Dickson, W. Draine, Samuel Dilworth, E. G. Edrington, W. M. Gray, Joseph P. Gazzam, J. W. Gustine, Thomas J. Gallagher, James B. Herron, W. M. Herron, John S. Irwin, R. B. Mowry, John Martin, William McK. Morgan, J. J. Myers, N. McDonald, G. McCook, F. McGarth, A. C. McCandlass, D. McMeal, John McCracken, J. H. O'Brien, John Pollock, A. M. Pollock, B. R. Palmer, T. W. Shaw, Jas. D. Shields, John Wilson, J. H. Wilson, C. F. Williams, and Thomas Perkins.

NATHANIEL BEDFORD MEDICAL SOCIETY

The first meeting of this society was held December 1, 1864, at the office of Dr. N. Rankin, Dr. Harry Coffy acting as secretary.

The next meeting was held a week later and the subject discussed was syphilis. At this meeting Dr. King proposed that this newly organized society be called for Dr. Addison. Dr. Mowry suggested that it be called for Nathaniel Bedford. The decision was postponed. December 15, Dr. Gallagher read a paper on albuminuria. December 22, the Society met at the home of Dr. Jones. At this meeting it was voted that the society be called in honor of Dr. Nathaniel Bedford, the Bedford Medical Society. December 29, Dr. Rankin resigned as a member for the reason that he had no time to attend its meetings. Dr. Jones read a paper on puerperal fever.

January 19, 1865, it was voted that a member absenting himself three nights in a month should be suspended.

January 26 the Society met at Dr. King's office. At this meeting Dr. Fleming read a paper calling for the organization of a medical school in Pittsburgh. The Club voted that the paper be published in the *Commercial Journal.*

February 18, 1865, Dr. Irish declined election for the reason that he could not hear well.

So the minutes of this Club go on week after week, and the last one recorded in the book is of March 30, 1885, by the then secretary, J. A. Lippincott. When the Club expired or why, I have been unable to learn.

It is most interesting to note, although this Club was started in 1864, the year before the reorganization of the Allegheny Medical Society, that it met weekly and that it required of its members who wished to retain membership a pretty steady attendance upon the meetings of the Club. In other words it was a Club without dead wood.

Thus it will be seen that it was the forerunner of the Pittsburgh Academy of Medicine organized in 1888, three years after the last known minutes of the Bedford Club. This young organization, like the Bedford Club, from the very beginning met once a week, provided a rule eliminating from membership those who habitually absented themselves from meetings. In nature and spirit, it would appear the Pittsburgh Academy of Medicine was the natural successor of the Bedford Medical Society, or in other words, it might be said the Bedford Club organized in 1864 was continued after 1885 as the Pittsburgh Academy of Medicine. The membership was limited to ten members. The original members were: Robert B. Mowry, M. O. Jones, George L. McCook, William A. Hallock, Thomas Gallagher, H. T. Coffy, James King and D. W. Rankin. The first president of the Club was Dr. Mowry and Dr. Coffy the first secretary. The following subsequently served as secretaries of the Club: Harry Coffy, Thomas Gallagher, R. B. Mowry, J. W. Wishart, J. W. Langley, E. S. Riggs, M. O. Jones, B. C. Jillison, A. Fleming, John Semple, D. Leasure, C. B. King, J. C. Rea and J. A. Lippincott.

Rev. William A. Passavant, d.d., Founder of the Passavant Hospital.

On September 16, 1876, the Bedford Society passed a resolution, deeply regretting the removal of Dr. Coffy to a distant city and commending him to his colleagues in his new field of labor. This resolution bears witness to the fact that Dr. Coffy was held in high esteem and deep affection by his colleagues.

The last recorded meeting of the Bedford Society occurred March 20, 1885; on this occasion the following members were present: Mowry, Fleming, Lippincott, King and Philips. The society adjourned to meet the following December with Dr. Semple as president. But it appears this was the last meeting of the Society.

The following list of the subjects discussed at the meetings of the Society sufficiently indicates the wide interest on the part of the members of this fine active, if short-lived, society: Paralysis, Albuminuria, Puerperal Fever, Hysteria, Mortification, Hydrophobia, Dysmenorrhea, Wounds of the Veins, Epidemics of Allegheny County, Geology of Allegheny, Syphilis, Spinal Irritation, Mammary Abscess, Hypertrophy of the Liver, Scarlatina, Asthma, Delayed but not Dangerous Labor, Tedious but not Difficult Labor, The Liver as a De-carbonizing Agent of the Blood, Mortuary Report of Pittsburgh, 1864.

THE ALLEGHENY COUNTY MEDICAL SOCIETY

The Allegheny County Medical Society was organized April 20, 1865, and at this meeting the following officers were elected: president, A. H. Crosse; vice-president, M. O. Jones; recording secretary, B. C. Jillison; assistant recording secretary, S. N. Benham; corresponding secretary, R. B. Mowry; treasurer, N. McDonald; censors, L. McCook, A. W. Achenbody, J. H. Ground.

A motion was made that the Society be started as a continuation or revival of the Allegheny Medical Society founded in 1848, which had become defunct. But this motion was defeated and the Society was on April 10, 1865, organized and started as an entirely new organization. I append a few names from the roster of those belonging to the Society from its beginning. The list is entirely too long to reproduce in full:

1865. R. B. Mowry, W. T. Coffy, John Dickson, W. A. Hallock, E. L. Walker, Thomas Gallagher, Franklin Irish, T. N. Rankin, C. B. King, Andrew Fleming, Thomas Mabon, O. L. Miller, W. S. Foster, A. L. Davis, T. W. Shaw, E. A. Wood, W. H. Daly.
1873. J. C. Dunn, E. S. Riggs, J. M. Stevenson, James Macfarlane.
1875. J. B. Donaldson, W. K. Van Kirk, W. T. English, R. A. Guildford.
1876. D. C. Christy, D. A. Hengst, C. A. Wishart, R. J. McCready.
1880. George Fundenberg, James H. Duffy, W. D. Rankin, John S. Mabon, W. W. Jones, W. D. Kearns.
1884. Adolph Koenig.
1885. William Mercur, A. K. Beatty, C. S. Shaw, T. M. T. McKennan, H. A. Hutchinson.
1888. A. S. Daggette, J. M. Thorn, J. L. Sroods, J. E. Rigg, C. J. Jackson, E. C. Huselton, W. P. Munn, Eugene Matson, E. B. Haworth, M. H. Lincoln.
1889. R. W. Stewart, J. B. Crombie, W. F. Robeson, J. M. Brockertoff, Robt. McGrew, M. R. Ward, C. O. Goulding, N. Blume, T. J. Patterson.
1890. Stuart Patterson, T. S. Pershing, I. J. Moyer.
1891. Guy McCandlass, T. J. Elterich, L. Litchfield, E. S. Montgomery, K. Emerling.
1892. P. J. Eadton, W. W. Day.
1893. Theodore Diller, R. C. Clarke, S. C. Milligan, J. E. Willetts, J. P. Kerr, W. T. English.
1894. O. J. Bennett, Morehead Murdoch, I. B. Reed.
1895. J. D. Heard, T. L. Disque, J. C. Ohail.
1896. J. O. Reed, J. W. Boyce.

In a recent communication to this Society the author attempted to give in some detail history of the early meetings of the Society, and we shall not repeat what was read on that occasion. The paper was published in the *Bulletin* of the County Society.

OTHER MEDICAL SOCIETIES

The Fortnightly Club was organized in 1882 for social purposes and for discussion of scientific subjects, and although nothing is said in the title to indicate that it was to be a medical society it appears that the members of the society were physicians and that the topics discussed were all medical in character. This Society lived, it appears, two years.

There were a number of smaller societies organized from time to time which flourished for a shorter or longer period, some of them partly social and partly medical in character, all of them aiming to cultivate good fellowship. Among these societies were the Austin Flint Club, the Duquesne Medical Club and the Mott Club.

THE PITTSBURGH ACADEMY OF MEDICINE

Coming down to a later period, the Pittsburgh Academy of Medicine was organized in 1888. This Society was originally modelled very largely on the plan of the Bedford Club, with a small select membership. It has steadily grown until now its membership is about 150. It owns a house and maintains a fine library, open to the entire profession in this district.

THE COLLEGE OF PHYSICIANS AND SURGEONS

The College of Physicians and Surgeons, which is founded on much the same lines as the Pittsburgh Academy of Medicine, is similar in its aims and was founded in 1906. Since then it has flourished and besides cultivating the science of medicine, it has aimed, with a large measure of success, to bring together in friendly concourse, not only physicians of this city but of adjacent territory.

HOSPITALS, MEDICAL SCHOOLS AND MEDICAL JOURNALS

THE PITTSBURGH MEDICAL JOURNAL

The first number of this journal appeared in December, 1880, with Dr. Robert C. Gallagher as editor and Dr. Charles S. Shaw as associate editor. In the following month, January, 1881, Dr. Shaw withdrew from the position of associate editor. In April, 1891, Dr. Thomas J. Gallagher, father of R. C. Gallagher, became associated with his son and under their editorial supervision the journal was published for three, possibly four years, when it became extinct.

PITTSBURGH MEDICAL REVIEW

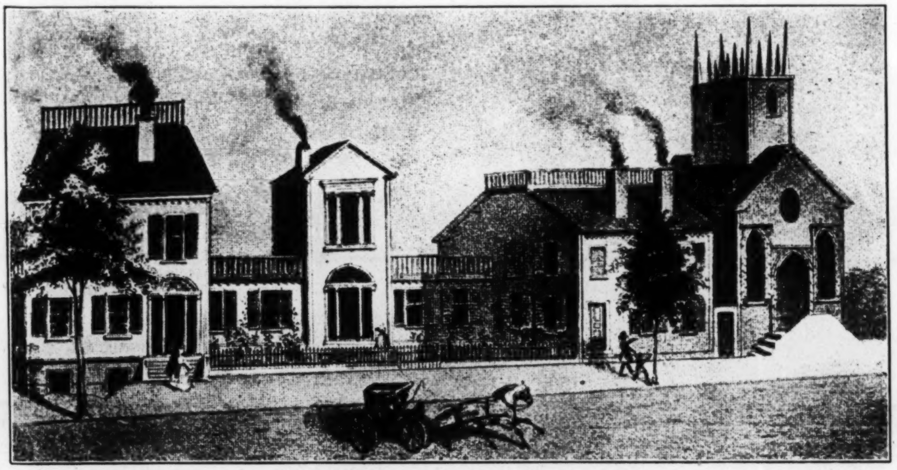
The first issue of this journal was published December, 1886. The editors and publishers were: X. O. Werder, J. J. Buchanan, P. McGough, C. C. Shaw, Adolph Koenig and J. J. Green.

In 1887 Drs. Hazzard and McGough resigned from the editorial staff and their places were taken by Dr. E. T. Painter and Dr. A. Pettit.

In 1891 Dr. Painter resigned, and his place was filled by Dr. E. G. Matson. At the beginning of 1893 the editorial staff was decreased in number by the resignations of Drs. Buchanan and Green. In 1894 the staff was again decreased by the resignations of Drs. Werder, Shaw and Pettit; and increased by the addition of Dr. T. M. T. McKennan.

In 1895 Dr. Koenig became sole editor and publisher of the *Review* and continued as such until June, 1897, when the *Review* was transformed into the *Pennsylvania Medical Journal*, and made the official organ of the Medical Society of the State of Pennsylvania, the first official organ of a state medical society in the United States. While this journal became the official organ of the medical society of the State of Pennsylvania, it remained the property of the editor and publisher. It continued to be published in this manner until 1904, when Dr. Koenig resigned as editor and transferred the ownership of the journal to the State Medical Society for the consideration of one dollar and the condition that the advertisements of secret, proprietary or trademarked remedies be forever excluded from the pages of the journal.

The profession in this part of the country owes a deep debt of gratitude to Adolph Koenig. The journal under his guidance stood for the highest and best in medical literature and was a pioneer in taking a stand against the exploitation of proprietary medicines. It stood alone in this position for some years at a time when money from these advertisements was badly needed to carry on the journal. But it never swerved from its course, and finally its policy was adopted by the *Journal of the American Medical Association* and is now accepted as a standard of ethics of all high grade, reputable medical journals. This pioneer work of the *Pittsburgh Medical Review* in cleansing our journals of obnoxious advertisements is here recorded with grateful appreciation of the high stand which Dr. Adolph Koenig and his associates, Drs. Werder, Buchanan and Shaw, made at this time.



PITTSBURGH INFIRMARY, 1849—THE CRADLE.

HOSPITALS

The first hospital in Pittsburgh has already been referred to, the hospital under the drawbridge, built in the time of General Hand. Reference has also been made to the hospital accommodation which Dr. Marchand built in connection with his house, at the time of the Revolutionary War. In the year 1833 a temporary hospital to house cholera patients was built in Pittsburgh.

Anything like a full record of the organization and work of the hospitals of this city would make a large record in itself; no attempt will be made to do this since the main purpose of this sketch is to record the early medical history of Western Pennsylvania. The author has not the material nor does he feel competent to record the history of our hospitals. So this important part of the history of medicine of Pittsburgh is passed over by making the following brief references to the hospitals of Pittsburgh.

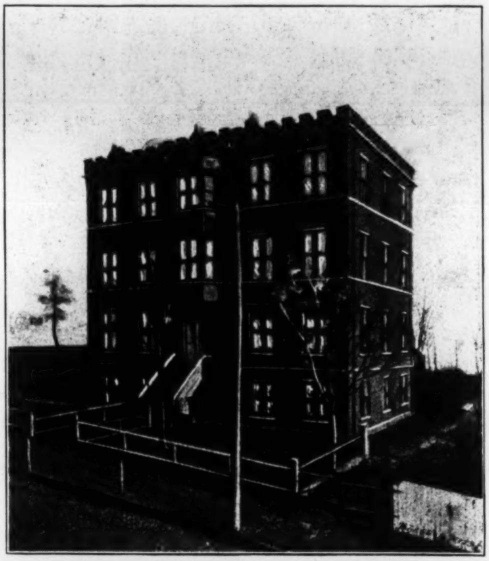
The Mercy hospital was founded in 1847 by Bishop O'Connor.

The Passavant Hospital was founded in 1848 by Rev. W. S. Passavant, whose name is honored in Pittsburgh as a philanthropist. This institution was conducted by Protestant deaconesses for nurses from Kaisersworth, Germany, where Florence Nightingale received her early training.

The West Penn Hospital opened in 1848 and until 1855 it received insane patients as well as medical and surgical cases. In this latter year, at the suggestion of Miss Dorothea Dix, a site was chosen on the Ohio River and a building erected for the insane. Dr. John Reed was placed in charge of this institution. It is doing useful work to the present day.

St. Francis Hospital was organized in 1865 and like the West Penn Hospital receives mental and nervous cases and serves a very useful purpose in the community.

There has been a very large development in hospitals in the last thirty years and plans are on foot now calling for the erection of buildings which require the expenditure of from $7,000,000 to $8,000,000. The chief hospitals besides those mentioned are at present the Children's Hospital, St. John's Hospital, St. Margaret's, Montefiore, St. Joseph's, Southside Eye and Ear Hospital, Magee Hospital and Allegheny General.



First Building of the Passavant Hospital, 1851.

MEDICAL SCHOOL

In one of the Pittsburgh newspapers for 1848 the suggestion was made that there should be a medical school in Pittsburgh. At the meeting of the Bedford Medical Society at the office of Dr. James King, January 26, 1865, Dr. Andrew Fleming read a notable paper calling for the organization of a medical school in Pittsburgh. Evidently the Society was greatly impressed with Dr. Fleming's paper, for it voted that it should be published in the *Commercial Journal.* Actually the first medical school was founded in 1886. The original building, until recently occupied, was erected on Brereton Avenue near 28th Street, adjoining the West Penn Hospital, where the fullest teaching facilities were granted the school.

In 1895 the school adopted a four year course and in 1908 it became by purchase an integral part of the University of Western Pennsylvania, which institution about the same time changed its name to the University of Pittsburgh. The school at present contemplates the erection of a general hospital. The new Presbyterian and Children's Hospitals to be erected soon will be affiliated with it. The school is one of the first class and is a credit to the community.

(*Conclusion.*)

* * *

[From Willis: Opera Omnia. Genevae, 1676.]

EDITORIAL

THE TEACHING OF ANATOMY AT EDINBURGH

The history of anatomical teaching at Edinburgh during the eighteenth and early years of the nineteenth centuries is familiar to all students of medical history, but its early history is not so well known. Some years ago Dr. John D. Comrie[1] published some most interesting facts bearing on the early history of medicine in Edinburgh and illustrating the prominence given to anatomical study before such weight was attached to it elsewhere.

In 1505 the Surgeons and Barbers Guild was incorporated. In its Charter it was stipulated that before he could become a freeman and master of the craft a candidate should submit to an examination, "that he know anatomea, nature and complexioun of every member In manis bodie And in lykewayes he knaw all the vaynis of the samyn that he may mak flewbothomea in dew tyme." The Town Council also granted to the guild "that we may have anis in the yeir ane condampnit man efter he be deid to mak antomea of quhairthrow we may half experience Ilk ane to instruct uteris." This, as Comrie points out, preceded the law of Henry VIII of 1540, by which the bodies of four executed criminals were given each year to the Barber-Surgeons of London. Comrie directs attention to some of the men who achieved prominence among the Scotch doctors. Three of them well illustrate the intimate relations which existed between Scotland and France during the sixteenth century when both those countries were in a state of more or less constant warfare with England. Henry Blackwood of Dunfermline taught at Paris in 1551, and was later elected Dean of the Faculty of Medicine of Paris. Mark Duncan of Roxburghshire was Regent of the University of Saumur in 1589. Peter Lowe of Errol served as a surgeon with the French armies for twenty-eight years, became one of the surgeons of Henri IV, and then returned to Scotland. He published the "Whole Art of Surgery" in 1598.

Comrie thinks that until 1645 the yearly demonstrations in anatomy were probably given by the Master Surgeons of the Guild in rotation, but in that year James Borthwick was admitted as a Master Surgeon for the special purpose of "desecting of anatomies for the farder instruction of prentises and servandes." In 1647 special rooms were rented for the purpose of the anatomical demonstrations, which Comrie says before that time were held in the house of the Deacon of the Guild. In 1669 the Guild built a "conveening house." In 1697 this hall was rebuilt.

From the minutes of the Guild in 1703–1704 it appears that different Master Surgeons used to demonstrate the various parts of the body. Thus in April, 1704, the following procedure was followed:

First day, James Hamilton, a discourse on anatomie in generall with a dissection and demonstration of the common teguments and muscles of the abdomen. *Second day*, John Mirrie, the umbilicus, omentum, peritoneum, stomach, pancreas, intestines, vasa lactea, mesentery, receptaculum chyli, and ductus thoracicus. *Third day*, Mr. Alexander Nisbet, the liver, vesica fellis, with their vessels, spleen, kidneys, glandulae renales, ureters, and bladder. *Fourth day*, George Dundas, the organs of generation in a woman, with a discourse of hernia. *Fifth day*, Robert Swintoun, the containing and contained parts of the thorax, with the circulation of the blood and respiration. *Sixth day*, Henry Hamilton, the hair, teguments, dura, and pia mater, cerebrum, cerebellum, medulla oblongata, and nerves within the head. *Seventh day*, Robert Eliot, the five externall senses, with a demonstration of their severall organs. *Eighth day*, John Jossy, the muscles of the neck and arm with a discourse on muscular motion. *Ninth day*, Walter Potter, the muscles of the back, thigh, and legg. The epilogue or conclusion by Dr. Archibald Pitcairn.

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[1] Comrie, J. D. *Edinburgh M. J.*, December, 1922.

In 1705 the demonstrations were placed in the hands of one man. Robert Elliot was chosen as "public dissector," and Comrie says he thus became "the earliest professor of this subject in Britain." In 1708 he was given an associate at his own request.

In 1694 the Town Council had granted to one of the members of the Guild, Alexander Monteath, a gift for thirteen years "of those bodies of fundlings that dye in the correction-house" and of "the bodies of fundlings that dye upon the breast." Other members of the Guild sought to obtain supplies of the same kind, so that the Town Council, in order to satisfy them, granted them "the bodies of fundlings who dye betwixt the tyme that they are weaned and their being put to schools or trades; also the dead bodies of such as are stiflet in the birth, which are exposed and have none to owne them; as also the dead bodies of such as are *felo de se* and have none to owne them; likewayes the bodies of such as are put to death by sentence of the magistrat, and have none to owne them."

In spite of such liberal provision of anatomical material, as early as 1711 complaints were made that graves were being robbed to supply dissecting material for the surgeons.

In 1720 Alexander Monro (primus) was elected Professor of Anatomy, and for nearly forty years he lectured to large classes on the subject. In 1758 he was succeeded by his son, Alexander Monro (secundus), who had been conjoint professor with him for the four preceding years. The second Monro was really the most distinguished of the family. He published many anatomical works. Comrie gives a brief summary of his dispute with William Hunter concerning priority in the discovery of the function of the lacteal vessels. The "foramen of Monro" commemorates his work on the anatomy of the brain.

In 1798 Monro, secundus, persuaded the Town Council to appoint his son Alexander as his colleague and ultimate successor. He retired ten years later and Alexander Monro, tertius, held the chair of anatomy until 1846. Thus the chair was held by these three members of the same family for a period of 126 years. Monro, tertius, was a lamentable failure as a teacher. The chief glory of Edinburgh anatomical teaching was transferred to the extramural teachers. The history of these is well known. Chief among them were John and Charles Bell, whose careers are well told by Comrie. Others who were successful in drawing large classes were John Barclay, Robert Liston, James Syme and the unfortunate Robert Knox. The sensational events which drove the latter from the town, when the murders of Burke and Hare were discovered and his connection with the Resurrectionists published, are familiar to all. This episode in the history of anatomy has somewhat overshadowed the splendid anatomical achievements of the Edinburgh teachers and a sober and erudite account such as that of Dr. Comrie has especial value.

BOOK REVIEWS

Centenario da Régia Escola de Cirurgia do Porto, 1825–1925. 7 pamphlets, 8vo. Porto, 1925. Catalago da Exposicão Retrospectivo de Medicina. Organizada por Pedro Vitorino e Alberto Saavedra, 107 pp., 2c., 16 pl., 8vo. Historia do Ensino Médico no Pôrto. Supplemento coordenado por Hernani Monleiro. 94 pp., 6 port., 8vo.

These seven pamphlets are the most important of those recently published to commemorate the centenary of the Medical Faculty of Oporto, otherwise known as the Royal School of Surgery (1825–1925). They comprise a catalogue of the historical exhibit displayed at the Crystal Palace (Oporto) during the week June 23–30, 1925, a history of medical education in Oporto, consisting of six biographical sketches of the faculty of the School (Roberto Frias, Maximiliano Lemos, Clemonte Pinto, José Dias de Almeida, João de Meira, Julio de Matos) with portraits, and historical sketches of the development of bacteriology, histology and embryology, legal medicine, neurology and psychiatry, and surgery in the school. These are all excellently documented as to illustrations, charts and bibliography, and reflect great credit upon the Oporto Medical Faculty, known to us principally through the excellent historical work of Maximiliano Lemos, editor of the *Arquivos de Historia da Medicina Portuguesa* (1886–1889, 1894–1896, 1910–1923) and a history of Portuguese medicine (2 vols., 1899). Particularly to our purpose among these pamphlets is the Catalogue of the Historical Exhibition, which includes 28 ms. letters (*consilia*) and diplomas of famous Portuguese physicians of date 1746–1862, with facsimile illustrations, an iconographic exhibit of objects, drawings and engravings including a curious seventeenth century pen drawing of the manual procedure in cesarean section, a collection of surgical instruments, obstetrical forceps and other objects, an exhibit of objects illustrating popular medical superstitions and folklore, autographs of famous physicians, medical medals, specimens of upholstery and clothing of early physicians, portraits of Portuguese physicians in oil and engraving, photographs and caricatures, pharmacists' mortars, jars and vases, and other museum specimens. We commend in particular Items 179–225, consisting of an exhibit of important Portuguese medical books (1539–1843), which will be a convenient check-list for medical librarians who wish to obtain these items. Apart from this creditable series of publications, the Centenary is further commemorated by a handsome medal and an unique postage stamp, bearing, both of them, the legend "Faculdade de Medicina do Porto."

F. H. Garrison.

RECENT ADVANCES IN PALEOPATHOLOGY

By Roy L. Moodie, ph.d.

CHICAGO, ILLINOIS

The following brief reviews and notices are intended to bring the bibliographic list of titles relating to ancient diseases up to date. Titles overlooked in the preparation and printing of the Bibliography in my "Paleopathology" are also given here.

At the meeting of the section for paleontology and heredity on June 20, 1923, at Vienna, Professor Abel,[1] the energetic European paleontologist, presented a review of the phases of paleopathology based on the outline given in my "Antiquity of Disease" (Chicago, 1923). He compared the lesions I have described from Mesozoic vertebrates with what he had seen on European material, especially the evidences of disease seen by him in the remains of cave bears recently assembled from the *Chiropterite* (fossil bat guano) at Mixnitz.

At the session held on October 24, 1923, Abel[1] discussed more fully the evidences of disease seen in the cave-bears especially, under fourteen headings.

It is to be hoped that Professor Abel will publish his findings, with illustrations, more in detail, since he doubtless has at his disposal the finest assemblage of Pleistocene pathological material in Europe. It is interesting to note his use of the roentgen ray in his studies.

We shall select from the fine memoir by Black, "The Human Skeletal Remains from the Sha Kno T'un Cave Deposit, etc."[2] only those evidences relating to disease or injury. The age of the material is regarded as Aeneolithic.

Caries of the teeth (p. 5) occurs from early childhood on. This was doubtless brought on by the gritty nature of the food which wore the teeth down to the pulp. Alveolar abscesses occur in the molar region, as in Figure 3, Plate v.

Three fractures (p. 7) show nothing of any significance. Osteoarthritic changes are noted in the bones of the tarsus but are infrequent elsewhere. On Plate v, Figure 1, is found a picture of a pathological mandible, but the nature of the disease is not given. The affliction seems to have been somewhat of the nature of leontiasis ossea, in an early stage, so far as one may judge from the picture alone.

Dr. Black is professor of anatomy at the Peking Union Medical College, China, and he is to be congratulated on producing a memoir of such worth on previously unknown material.

While not new, Holländer's results, published in "Plastik und Medizin"[3] should be noted as the title has not previously been given in the literature of paleopathology. Most of these Peruvian potteries figured are preserved in the Berlin Ethnological Museum and I have not previously seen these examples depicted in medical literature. Among the bodily disturbances indicated by these pre-Columbian potteries are: facial deformations due to facial paralysis, uta, blindness, abscess formation, lupus, injuries; amputations of the feet; verruga peruviana (the so-called wart disease) and other minor pathological changes.

Goldschmid[4] has figured additional material of this nature.

Knaggs[5] figures a Peruvian skull, possibly pre-Columbian, preserved in the Museum of the Royal College of Surgeons. There is no history of the specimen. The skull is interesting because it shows how, by the attachment of the periosteum to the sutures, the growth of the lesions of leontiasis ossea has been temporarily stopped. The face and mandible are greatly deformed by the periostitis. If this is a prehistoric skull it is the only known example of leontiasis ossea in ancient times.

Dr. Means has produced interesting results in his paper, "A Roentgenological Study of the Skeletal Remains of the Prehistoric Mound Builders of Ohio,"[6] probably the best of its kind which has appeared in print. His roentgenograms are good and well selected. They show syphilis, coxa vara, hypertrophic arthritis, Pott's disease, fractures and other examples of deforming osteitis due to injuries.

His discussions are meager and conservative and his pictures clear and conclusive. He apparently is unaware of similar and extensive studies in paleopathology which have been done elsewhere, so his study is not a critical one.

The dating of the material as prehistoric is not warranted. There is no evidence that the mound builders formed a distinct race,[7] since thousands of years may have been consumed in the formation of the mounds. The importance of intrusive burials is not mentioned.

Pioneer studies of this type are to be welcomed for the good they contain. We hope a more critical study may follow.

In an attempt to arrive at a correct understanding of the nature of the curious outgrowth on the radii of a fossil dog, Romer[8] has reviewed the entire subject. He finds the same type of exostosis present on seven out of nine radii of *Daphoenus*, and found it on both radii in two cases. The lesions are of a uniform character and all have the same point of origin from the body of the radius. It seems improbable that the outgrowths are pathological, but are to be regarded as outgrowths into the muscles which attach at this point, i.e., the brachioradialis and the pronator teres. The exaggerated condition of the outgrowth may be brought about by interference between the legs. The writer says: "The only pathological explanation which can be given for the growth of all or a part of the process in question is that of a bony growth caused by a local stimulation."

A writer in *Biometrika*[9] has no trouble in explaining the nature of these outgrowths as a "tendency to occur at the 'growing ends' of bones, as in man"; a statement so foolish that we wonder if that writer ever saw an exostosis.

Another statement that exostoses seem to be as ancient as bones themselves is utterly without facts to support it. Exostoses are emphatically not as old as bones by a great deal. This same writer wonders why I did not notice in my book "Paleopathology"[10] the exostoses on *Pithecanthropus*. These lesions are so definitely described, figured and explained that I cannot understand the reviewer's neglect. He might have consulted my index, at least, but he appears to have been content to write this review without consulting the volume. Other statements of a derogatory nature occur further down (p. 201), but they read so like the writings of one entirely ignorant of his subject that we are surprised to find such statements in a journal of such high standards as *Biometrika*.

An unusually large, incomplete femur of a Swiss Neolithic lake dweller, described by Schlaginhaufen[11] suggests acromegaly. Unfortunately the skull is not preserved, so there is no possibility of examining the pituitary fossa. The bone is figured on Plate XI, Figures 1 to 4 and Plate XII, Figure 1. A careful roentgenological examination of the bone does not convince Dr. Schinz of the accuracy of the diagnosis and on page 155 he discusses the possibilities.

Sladen[12] is mistaken in the statement that tuberculosis is known among the dinosaurs, whose "backbones were stiffened with tuberculosis millions of years before Percival Pott was Surgeon to St. Bartholomew's." He attributes the reference to Dr. Slosson, possibly in "Science Service," but the statement is incorrect. The oldest known evidence of tuberculosis is a case of Pott's disease in a Neolithic man, who lived possibly 25,000 years ago. The stiffening of the vertebral regions in dinosaurs is probably of traumatic origin, resulting in lesions of spondylitis deformans.

The beautiful volume by well-known authors, Smith and Dawson, on "Egyptian Mummies"[13] is a résumé of the studies of recent years made in Egypt, where the senior author, particularly, took so much interest in mummification. He has followed the spread of this cult throughout the world and has based thereon a suggestion of the part Egyptian culture has played in the development of civilizations. The pages of the present book, however, are devoted to a careful account of mummies.

The development and growth of anatomical teaching is certainly due to the spread of mummification in early times and made possible the Alexandrian School. While there are many interesting lines of thought opened by this book yet I wish to confine attention here to the contributions made to paleopathology and their relations to early history.

Pathological alterations in a female skull are mentioned on page 78. The mummy of Ramses V shows (Fig. 28) skin eruptions on the right cheek which may be smallpox. If we may judge from the condition of the teeth, Amenophis III (p. 95) suffered toothache. The skull of Akhenaten reveals a slight degree of hydrocephalus (p. 96). The Pharaoh Siptah (p. 100, p. 157 and Fig. 65) had club-foot. The famous example of Pott's disease (Fig. 62) in a mummy of a male priest of Amen is mentioned because the embalmers had made a successful mummy of a man with an extreme deformation of the spine.

Chapter X (pp. 154–162) is devoted to "Mummification in Relation to Medicine and Pathology." Figure 63 shows an interesting vertebra affected with tubercular caries from a mummy of the Middle Kingdom. A femur of the Fifth Dynasty shows a huge osteosarcoma (Fig. 64). The hands of a mummy of a Coptic Christian afflicted with leprosy (6th Century A.D., Nubia) and feet of the same mummy are depicted in a photographic plate (Fig. 66–67). A predynastic skull shows (Fig. 68) destruction of the mastoid process by disease. The primitive splints (Fig. 69) around a broken forearm of a Fifth Dynasty mummy have received much attention.

The review of the paleopathology of Egypt, given in Chapter X, is brief though adequate for the authors' purpose. The work of Ruffer, Schmidt, Wood-Jones, G. Elliot Smith and others is given adequate recognition.

An interesting feature of this splendid book is the use of forty-eight wood cuts by H. Horace Gerrard and K. Leigh-Pemberton. They are most successful in showing details in objects ill adapted to photographic illustration.

Dr. Snure[14] has produced an interesting paper but we cannot help a feeling of regret that his study was not more critical. Roentgen-ray studies of pathological material of prehistoric and fossil forms have been made during the past ten years. His interpretation of fossilization is at fault and his observations on the material inaccurate. Thus his statement about the absence of small bones is quite wrong. Yet with all these mistakes and hasty interpretations the author has produced a noteworthy contribution.

He has shown us, for example, how to study the normal anatomy of the paranasal sinuses. A large ground sloth shows, under the roentgen ray, numerous calcified nodules, which had developed in the mucosa sini frontalis, due either to slight hemorrhages or parasites during life. His assumption of tuberculosis in the acetabulum of a sabre-tooth tiger is unwarranted. The lesion may have been of traumatic origin. His further discussion of tuberculosis of animals needs more consideration than he devoted to it. Dr. Snure was apparently unaware of the extensive literature of paleopathology but he has produced an interesting and valuable account.

Cave exploration, or spelaeology, has had a respectable history in England and the subject has attracted the attention of a number of distinguished writers. Among the officers of the Bristol Spelaeological Society one notes the names of Sir W. Boyd Dawkins, known for his writings on caves, and of S. H. Reynolds, professor of geology at the University of Bristol, known for his studies on Pleistocene mammalia.

The ancient teeth, representing the Azilian Epoch, at the opening of the Neolithic, are described by the secretary, Tratman.[15] He notes a number of morbid changes. Of 100 teeth over 55 per cent show evidences of chronic periodontitis of two types. There are a number of carious teeth representing molars and premolars. Fracture has brought about exposure of the pulp in one case. Marked pittings indicate a deficient diet in infancy. It is too bad that no figures accompany this brief account. Our knowledge of prehistoric caries is all too small.

The senior author, F. B. Young, of the article, "Evidences of Disease as Shown in Fossil and Prehistoric Remains,"[16] from his residence at Gering, Nebraska, became acquainted with the Miocene fossil mammals, so abundantly preserved in the bluffs of the Niobrara River Valley, through Mr. Harold J. Cook, whose ranch includes one of the most famous fossil-bearing deposits in the world, known as the Agate Springs Fossil Quarry. In point of abundance of fossilized skeletal material it ranks next to the Pleistocene deposits of the Rancho la Brea asphalt pits of southern California. It was only natural that Dr. Young should become interested in the evidences of disease abundantly represented in the remains from these two deposits. The publication of the results of this study will be awaited with interest.

References

1. Abel, D. Neuere Studien über Krankheiten fossiler Wirbeltiere (Vortrag). *Verhandl. Zoo, log. Botan. Gesellsch.*, Wien, 1924, LXXIII-98–107; 165–174.
2. Black, D. The human skeletal remains from the Sha Kno T'un cave deposit in comparison with those from Yang Shao Tsun and with recent North China skeletal material. Paleontologia Sinica (Geol. Surv. China), Ser. D, I, Fasc. 3, pp. 1–119, pl. I–XIV, 86 tables, 1925.
3. Holländer, E. Die anthropomorphen Terrakotten mit Krankheitsdarstellungen aus dem alten Inkareiche. In "Plastik und Medizin," Stuttgart, 1912, pp. 391–439, Figs. 283–325.
4. Goldschmid, E. Entwicklung und Bibliographie der Pathologisch-Anatomischen Abbildungen. Leipsig, 1925, 4to, 301, pp., 44 pl.
5. Knaggs, R. L. Leontiasis ossea. *Brit. J. Surg.*, Bristol, 1923–1924, XI, 355, Fig. 241.
6. Means, H. J. A roentgenological study of the skeletal remains of the prehistoric mound builder Indians of Ohio. *Am. J. Roentgenol. & Rad. Therap.*, N. Y., 1925, XIII, 359–367, 6 pls.
7. Collins, H. B., Jr. Archeology in the Southern States. *Sci. Mo.*, Apr., 1926, pp. 322–329. "We know today that there never was a 'race' of mound-builders; the building of mounds was simply a custom that was shared by a number of Indian tribes of different stocks."
8. Romer, A. S. A radial exostosis in the fossil Canid *Daphoenus*. *Am. J. Sci.*, N. Haven, 1924, VIII, pp. 235–240, Figs.
9. The study of palaeopathology notices. Reviews of Moodie's "Paleopathology" and Ruffer's "Studies in the Paleopathology of Egypt." (Signed by P. S.) *Biometrika*, Cambridge, 1924, XVI, 200–202.
10. Moodie, R. L. Paleopathology; an Introduction to the Study of Ancient Evidences of Disease. Urbana, 1923, p. 347, pl. LXXI, and p. 382.
11. Schlaginhaufen, O. Die menschlichen Skelettreste aus der Steinzeit der Waulwilersees (Luzern) und ihre Stellung zu andern anthropologischen Funden aus Steinzeit. Zürich, 1925, 12 pls., 52 figs., pp. 154–155.
12. Sladen, F. J. Collected Papers by the Staff of the Henry Ford Hospital (Detroit), first series 1915–1925. N. Y., 1926. Foreword, p. ix.
13. Smith, G. E., and Dawson, W. R. Egyptian Mummies. N. Y., Dial Press, 1924, pp. 1–190.
14. Snure, H. A roentgen-ray study of the La Brea (Calif.) fossils. *Am. J. Roentgenol. & Rad. Therap.*, N. Y., 1924, XI, pp. 351–354.
15. Tratman, E. K. Notes on the human teeth obtained from Aveline's Hole, Burrington Combe, Somerset. Proc. Spelaeolog. Soc. (Univ. of Bristol), 1921–1922, I, No. 3, 122.
16. Young, F. B., and Cooper, A. L. Evidences of disease as shown in fossil and prehistoric remains; paleopathology. J. A. M. A., Chicago, 1926, LXXXVI, No. 11, 789.